Letter Report
Engineering, Economic and Environmental
Evaluation

LYNN-NAHANT BEACH BEACH EROSION CONTROL IMPROVEMENT

LYNN-NAHANT, MASSACHUSETTS

Volume 1

December 1981

US Army Corps of Engineers
New England Division

LYNN-NAHANT BEACH
EROSION CONTROL STUDY
LYNN-NAHANT, MASSACHUSETTS

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LYNN-NAHANT BEACH
EROSION CONTROL STUDY
LYNN-NAHANT, MASSACHUSETTS

PURPOSE

This letter report is being submitted to demonstrate the justification of Federal participation with the Commonwealth of Massachusetts in the cost of constructing the authorized beach erosion control project titled "Lynn-Nahant Beach, Lynn-Nahant, Massachusetts." This project was adopted on 3 September 1954. Since 27 years have elapsed between project authorization and the formal request by the State for Federal financial assistance, it was necessary to prepare this update of the approved report. The report has been reviewed for technical adequacy, updated with environmental and economic justification, and revised in accordance with recent changes in laws and regulations.

AUTHORITY

The study was approved by the Chief of Engineers on 2 October 1945, in accordance with the authority of Section 2 of the River and Harbor Act, approved 3 July 1930 and Public Law 166, 79th Congress, approved 31 July 1945. The study was completed in June 1949. This letter report is a review of this authorized report.

PRIOR REPORTS

In a letter dated 9 August 1945, the Metropolitan District Commission (MDC) of the Commonwealth of Massachusetts formally requested that cooperative beach erosion control studies be undertaken in the vicinity of Boston, Massachusetts. The beaches studied were Lynn-Nahant, Revere, Winthrop, Quincy Shore, and Nantasket. A report for Lynn-Nahant Beach titled "Beach Erosion Control Report on Cooperative Study of Metropolitan District Commission Beaches, Part A, Lynn-Nahant Beach " was completed and submitted to the Beach Erosion Board on 1 June 1949. The report was approved by Congress and published in House Document No. 134, 82D Congress, 1st Session, dated 17 May 1951.

REQUEST TO PROCEED

In a letter dated 11 September 1978, the MDC requested that the sandfill portion of the Lynn-Nahant Beach erosion control report, as approved in House Document No. 134, 82D Congress, 1st Session, dated 17 May 1951, be considered for construction. The MDC letter indicated that they are now in a financial position to construct the sandfill portion of the project along Lynn-Nahant Beach. The rock portion of this project, which extends south of the proposed beachfill will not be undertaken at this time.

LOCATION

The beach, designated in this report as "Lynn-Nahant Beach," is one continuous beach comprised of King's Beach Reservation in the town of Swampscott, Lynn Short Reservation in the city of Lynn, and Nahant Beach Parkway in the town of Nahant, all of which are in Essex County, Massachusetts. Lynn Beach is located between the towns of Swampscott to the north and Nahant to the south. A small section of the southern end of the proposed project is located in the town of Nahant. The beach is 7 1/2 miles northeast of the city of Boston.

DESCRIPTION

Lynn-Nahant Beach comprises a bayhead beach and tombolo forming the head of Nahant Bay and extends a distance of 2 3/4 miles between two headlands, Blaney Rock on the north and Little Nahant on the south. The coast is highly developed, consisting of a year-round residential area with large houses fronting Lynn Shore Drive.

The beach is owned and operated by the Metropolitan District Commission and is paralleled for its entire length by public highways which are separated from the beach by public walks and promenades. The backshore area consists of a bathhouse, an MDC Police Station, a children's play area, and a refreshment stand. Across the street are a ballfield, tennis courts, and a boat launching ramp. Free public parking is provided for users behind the beach. The tombolo area is developed as a picnic area with fireplaces, playgrounds, and bathing facilities.

The Lynn-Nahant Beach is the result of erosion of the mainland headlands and of the former island of Little Nahant, and the deposition of wave-transported materials from other nearby sources. The offshore area immediately adjacent to the beach is relatively shallow, with the 18-foot contour being about 4,500 feet from the shoreline. Beyond this point, the ocean bottom drops rapidly to a depth of 60 feet about 10,000 feet from the shoreline.

THE AUTHORIZED PLAN

The authorized plan as stated in the authorizing document, consists of the direct placement of approximately 172,000 cubic yards of suitable sandfill for a distance of 2,600 feet between Woodbury's Point and the dune on the Nahant tombolo. This plan would provide a protective, recreational dry beach berm along the backshore to an elevation of 18.0 feet above mean low water (MLW). The plan will restore the recreational dry beach area lost over the years and provide a helthful beach bathing area as well as protection to the backshore structures.

PLANS OF IMPROVEMENT

The authorization document recommended that the best method of correcting the erosion problem was by the direct placement of suitable sandfill along the 2,600 feet of shore. Our more recent investigation, and that of a consulting engineer hired by the MDC, are in concurrence with this recommendation. The investigations also determined that the backshore wall at Woodbury's Point is reflecting all incoming waves across the beach, thus causing the loss of beach material to the south. As a result of this determination, several alternative plans of improvement were evaluated. These plans consist of sandfill alone (authorized plan), rock revetment along the toe of the seawall at Woodbury's Point with sandfill, and a low profile groin structure located approximately 300 feet south of Woodbury's Point with sandfill. The plans, although they appear to be feasible, require additional detailed studies above those discussed in the attached Section 404 Evaluation, to determine the environmental and aesthetic impacts on the beach and adjacent shoreline. At this time it was determined that sandfill was the most practical and economical plan of improvement. After construction, the beach should be monitored by surveys twice a year, and any structural improvements necessary will be based on actual field observations and future survey analysis.

ECONOMIC ANALYSIS

The benefits derived for this project are based primarily on the authorized plan of improvement as stated in the 1949 report. At the present time, the dry beach area above the mean high waterline is minimal. The water reaches the seawall at high tide for most of the distance between Woodbury's Point and the bathhouse. Only near the bathhouse does a fairly wide beach exist.

Presently, an estimated 12,000 people use the Lynn-Nahant beach on weekdays, and approximately 30,000 people on peak summer days. Few people use the Lynn portion of the beach due to the lack of dry beach space above the mean high waterline. When the proposed improvement is completed, the overcrowding that occurs on warm-weather days would be dispersed to the Lynn part of the beach.

Traffic counts taken in the summer of 1975 showed an average daily traffic flow of 14,000 vehicles traveling the Lynn-Nahant causeway. Peak summer volumes can exceed these rates substantially.

The benefits derived for this area are a result of direct and indirect damages prevented, increased recreational usage and increased property values, with beach use the primary benefit. A total benefit of $302,000 will be realized for this project. For details see Appendix 4, "Benefit Analysis."

SIGNIFICANT CHANGES

The following is a brief discussion of the changes that have occurred since the authorized report.

Cost Sharing - The project was authorized with a Federal share of one-third and a non-Federal share of two-thirds of the first cost of construction. The Federal and non-Federal shares of the first cost of construction was changed by Public Law 87-874, River and Harbor Act of 1962, as amended. This cost sharing is discussed in Appendix 3.

Annual Charges - When the project was adopted in September 1954, the total annual charges were based on interest rates of 3 percent for Federal cost, 3 1/2 percent for non-Federal cost, and amortization of depreciation and obsolescence over a period of 40 years. Using a 1982 price level, the total annual charges are $174,200 based on an interest rate of 7.625 percent with amortization of depreciation and obsolescence over a period of 50 years. The increase in the annual charges is due primarily to an increase in unit price of construction material between the time of authorization and today.

Periodic Nourishment - Periodic nourishment is found to be a more economical erosion protection measure than retaining structures such as groins or when the nourishment is expected to be of benefit to shores beyond the project limits. Prior to the River and Harbor Act of 1962, all authorized projects were constructed and maintained by the local sponsor. The new act revised not only the construction procedure but also the participation in periodic nourishment. Therefore, we are recommending that periodic nourishment for the period of evaluation be included as part of the cost of construction. This cost will be shared with the Commonwealth of Massachusetts and will continue throughout the 50-year period of analysis. (See Appendix 3, "Engineering Analysis" for details.)

Annual Benefits - Beaches in New England derive their benefits due to the steadily growing demand being placed on available public and private beaches; Lynn Beach is no exception. Current regulations have permitted us to include additional types of benefits in our calculations. The basic benefits listed in the authorized document have not been changed, however, additional benefits included in this report are authorized by the U.S. Water Resources Council's "Principles and Standards," established by PL 89-80, pursuant to Section 103 of the Water Resources Planning Act, effective date 25 October 1973.[1] The benefits contained in the 1951 authorizing document are $41,770 while the benefits under 1982 price levels are $302,000, based on a 50-year period of analysis. (See Appendix 4 for details.)

Foreshore Slope - The authorizing document shows a sandfill design with two slopes. One slope is 1 on 17 from the backshore to approximately the mean high waterline; from there seaward the slope if 1 on 55 until it intersects the existing ground. For convenience of construction and payment to the contractor, a sloping beach berm varying from 1 on 12 to 1 on 35 will be shown extending from the wall to approximately the mean high waterline, sloping seaward on a 1 on 50 to intersect the existing ground at approximately the existing mean low waterline. This proposed shape when worked by the natural elements will eventually take the shape as stated in the authorized document.

[1]All benefits were not included as part of our overall analysis. The primary benefit is beach use and damage prevention.

Sandfill Quantities - An increase in the sand quantities was anticipated because of the instability of the sand and the reflection forces off the backshore vertical concrete walls. Recent surveys by the engineering firm preparing plans and specifications for the State indicated that 175,000 cubic yards of sandfill was now needed to satisfy the requirements of the revised cross section. This is more than the authorized quantity of 172,000 cubic yards. The change in quantities was a result of a basic design shape change and erosion over the years.

Period of Economic Analysis - The period of analysis for economic evaluation has been changed from 40 years to 50 years.

Benefits to Cost Ratio - The benefits to cost ratio of the authorized report was 1.5:1 at the 3.0 percent Federal and 3.5 percent non-Federal interest rate. The updated ratio is 1.73:1 at a Federal and non-Federal interest rate of 7.625 percent.

Sandfill Elevation - The project was adopted with a backshore elevation of of 18.0 mean low water. New data indicates that 17.0 mean low water is more representative of the adjacent shore and will provide adequate protection.

VARIATION FROM THE AUTHORIZED DOCUMENT

The following table compares key items in the authorized document with present day values.

TABLE 1

ITEM	AUTHORIZED IN 1954 (1949 price level)	PRESENT (1982 price level)
Interest Rate		
Federal	3.0%	7.625%
Non-Federal	3.5%	7.625%
Cost Sharing		
Federal	33.33%	57.7%
Non-Federal	66.67%	42.3%
Period of Economic Analysis	40 years	50 years
Backshore Elevation (sandfill)	18.0 MLW	17.0 MLW
Sandfill	172,000 cy	175,000 cy
First Cost	$464,000	$1,590,000
Annual Charges	$28,020	$174,200
Periodic Nourishment	N/A	$56,000
Annual Benefits	$41,770	$302,000
Benefit to Cost Ratio	1.5 to 1	1.73 to 1

ENVIRONMENTAL CONSIDERATIONS

The project is considered a minor action; therefore, an environmental assessment has been prepared in lieu of an environmental impact statement.

Environmental Impact Report - The Environmental Impact Report is based on a review of the environmental, economic and archeological impacts of the project as well as the needs of the people. The assessment reveals that the project is economically justified, with minimal short-term adverse effects and no long-term adverse effects on the area due to the construction of the authorized project. Volume 2 contains the Environmental Impact Report prepared by the MDC.

404 Evaluation and Factual Determination - Under Public Law 92-500, Federal Water Pollution Control Act enacted 18 October 1972, project files and Federal regulations were reviewed to properly evaluate the objectives of the project. It was concluded that the project is designed to control beach erosion and will enhance aesthetic, recreational, and economic values without irreparable damage to the surrounding environment. (See Appendix 1 for details.)

PUBLIC VIEW AND RESPONSES

Public Involvement - Public involvement is essential in the study of beach restoration and protection projects that generate public benefits and require the expenditure of Federal funds. Initial public involvement consisted of meetings with Federal, State, local and select interest groups but not always the general public. Subsequent meetings with the general public will be conducted by the State in the near future.

Permit, Clean Water and Consistency Certification - The State is in the process of permitting the project and issuing clean water and consistency certifications. Copies of these items will be forwarded upon receipt, advanced tenative approval letters are included in Appendix 5.

CONDITION OF LOCAL COOPERATION

The Metropolitan District Commission in accordance with laws of the Commonwealth of Massachusetts was informed of the conditions of local cooperation to obtain Federal participation in the cost of the authorized project. Appendix 2 contains the items of local cooperation.

COORDINATION WITH OTHER FEDERAL, STATE, AND LOCAL INTERESTS

Several meetings were held with Federal and State officials to formulate and implement the construction of the work to be accomplished at Lynn-Nahant Beach. In addition, the MDC has held several workshop meetings with State and local interest and is planning to attend an open meeting of the conservation commission seeking comments on the proposed project. Appendix 5 contains pertinent correspondence from various agencies during the course of the study.

CONCLUSIONS

During this update pertinent letters, documents and views of interested agencies and concerned groups have been reviewed and evaluated in light of the overall public interest. The benefit to cost ratio was found to exceed 1.0, which is an acceptable level for Federal participation and cost sharing. Deletions and changes from the authorized project are considered minor and necessary in light of existing field conditions. Due to the favorable economic justification, Federal participation of 57.7% of the construction cost of the plan of improvement; periodic nourishment; and design, engineering, and other related construction costs is appropriate (see Plate 2).

RECOMMENDATIONS

The Division Engineer recommends that protective measures be undertaken as approved by the Chief of Engineers, United States Army, 2 October 1945, in accordance with the authority provided by the provisions of Section 2 of the River and Harbor Act approved 3 July 1930 and Public Law 166, 79th Congress, approved 31 July 1945. The recommendations are subject to the following conditions:

a. Approval by the Chief of Engineers prior to commencement of detailed plans and specifications.

b. Construction of the project is to be accomplished by non-Federal interests with reimbursement of the Federal share of the cost of construction upon completion of construction.

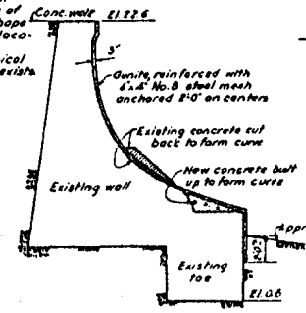
c. Local interests will be required to comply with conditions of local cooperation as stated in Appendix 3.

It is recommended that the United States agree to reimburse State upon completion for 57.7 percent of the cost of construction, periodic nourishment, and related expenses.

LYNN-NAHANT BEACH
LOCATION MAP
PLATE 1

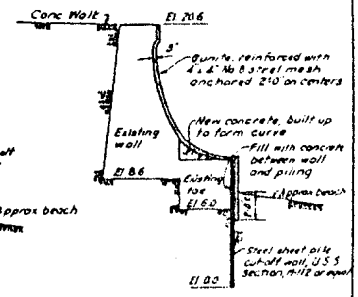
NOTE

Existing toe does not extend entire length of wall and varies in shape and size at various locations. Sections show typical conditions where toe exists.



SECTION NEAR PROFILE 8

TYPICAL TREATMENT WHERE CUTOFF WALL IS NOT REQUIRED



SECTION AT PROFILE 7

TYPICAL TREATMENT WHERE CUTOFF WALL IS REQUIRED

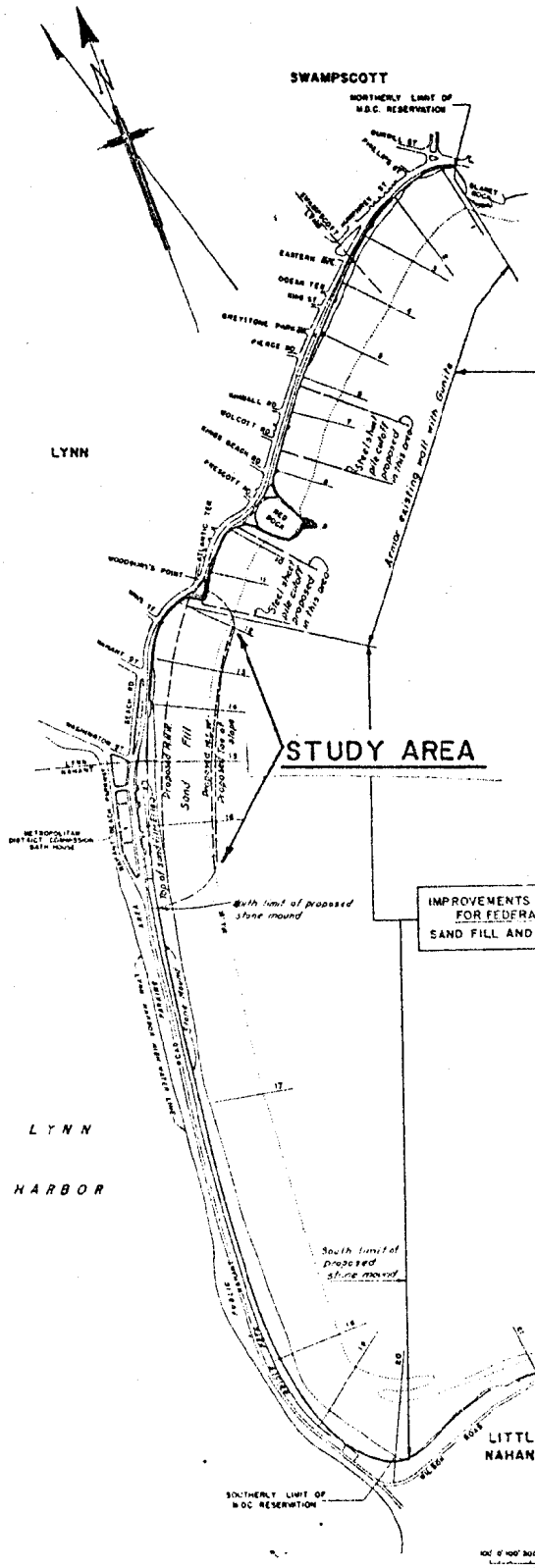
DETAILS OF GUNITE ARMOR AND STEEL SHEET PILE PROTECTION

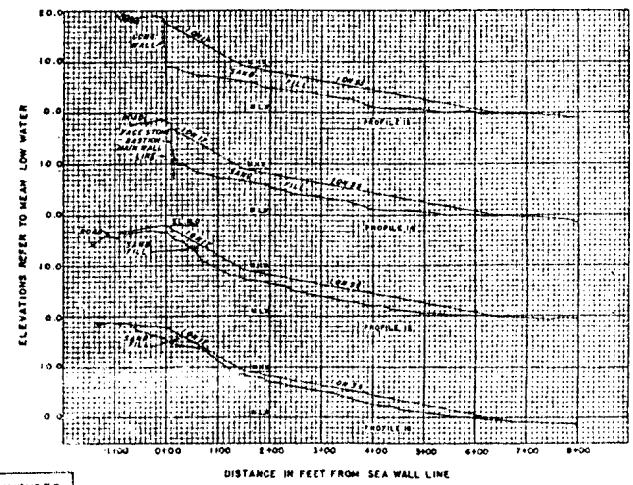
FOR EXISTING CONCRETE WALL

SCALE 1/4"=1'-0"

IMPROVEMENT RECOMMENDED

MAINTENANCE OF EXISTING WALL BY LOCAL INTERESTS

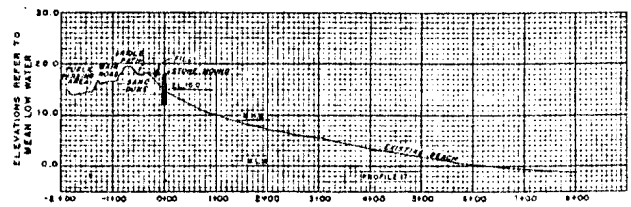




TYPICAL SECTIONS OF SAND FILL

IMPROVEMENTS RECOMMENDED FOR FEDERAL PROJECT

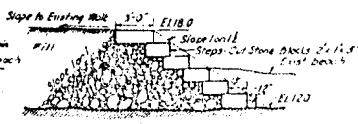
SAND FILL AND STONE MOUND



LOCATION OF STONE MOUND

TYPICAL SECTION AT PROFILE 17

TYPICAL SECTION



STEP SECTION

DETAILS OF STONE MOUND

SCALE 1/4"=1'-0"

NOTE

Steps required at 23 locations to provide access to fireplaces and tables at base of sand dunes

NOTES

All elevations refer to Mean Low Water.

Beach profiles from survey by Corps of Engineers, Oct-Dec. 1945 and May 1946.

Nahant Road and Public Parking Area was reconstructed in 1941, and relocated so that Public Parking Area is adjacent to sand dune.

To Accompany Report Dated June 1, 1949

WAR DEPARTMENT
CORPS OF ENGINEERS
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION, BOSTON, MASS.

DRAWN BY P.D.D.
TRACED BY P.D.D.
CHECKED BY
SUBMITTED BY
APPROVED

METROPOLITAN DISTRICT COMMISSION
BEACH EROSION STUDY

PLANS OF PROTECTION
LYNN-NAHANT BEACH
MASSACHUSETTS

APPROVED DATE MAY 31, 1949

SCALE AS SHOWN

DRAWING NUMBER

52 F-15-2

PLATE 2

APPENDICES

APPENDIX 1

404 EVALUATION

APPENDIX 1

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NEDPL-I 24 July 1981

PUBLIC NOTICE

Application of Section 404 of the Federal Water Pollution Control Act, as amended (enacted 28 December 1977 and commonly referred to as the Clean Water Act), involving the discharge of dredged or fill material into waters of the United States for the proposed project:

SMALL BEACH EROSION CONTROL

LYNN-NAHANT BEACH

LYNN, MASSACHUSETTS

The New England Division, U.S. Army Corps of Engineers has completed a preliminary Section 404(b) Evaluation for the proposed Beach Erosion Project, Lynn-Nahant Beach, Lynn, Massachusetts. This evaluation contains information of the effects of the discharge of fill material into waters of the United States.

The purpose of this notice is to provide interested parties with the opportunity to submit their views and opinions concerning the water quality aspects of the proposed discharge and to insure that the needs and desires of the public are incorporated into the project whenever possible.

Project Authorization

Authorization for a Detailed Project Report for Lynn-Nahant Beach was given under general authority contained in Section 2 of the River and Harbor Act approved 3 July 1930 and Public Law 166, 79th Congress, approved 31 July 1945.

Location

Lynn-Nahant Beach is located on the west side of Massachusetts Bay in the city of Lynn. It is approximately 10 miles northeast of Boston and about 20 miles southwest of Gloucester.

Project Description

The recommended plan calls for approximately 185,000 cubic yards of suitable sandfill to be placed along 2,600 feet of Lynn-Nahant Beach between Woodbury's Point and the dune on the Nahant tombolo. The proposed sandfill is designed to extend seaward to approximately the existing mean low waterline. The fill material will originate from an appropriate inland site in Massachusetts. The project also includes annual periodic nourishment which will be cost shared equally. Lastly, there is also the possibility of either groin or revetment construction, at a later date.

Environmental Assessment

A draft Environmental Impact Report is being written by the State of Massachusetts and will be available within a short period of time.

Section 404(b) Evaluation

The Section 404(b) Evaluation has been conducted in accordance with the guidelines (40 CFR Part 230) issued by the United States Environmental Protection Agency under the authority of the Federal Water Pollution Control Act as amended. The evaluation addresses the water quality considerations contained in Section 404 guidelines, Part 230, Subparts B, C, D, E, F, G and H.

Public Response

Any person may submit written comments within 30 days of the date of this notice, or request in writing that a public hearing be held to consider the water quality aspects of the proposed project. Requests for a public hearing should state the particular reasons for holding a hearing. It is essential that all potential problems, needs and desires of the community surface now to insure timely consideration.

After considering the comments received in response to this notice, the 404(b) Evaluation may be modified to reflect the concerns expressed in the comments. All verbal communication should be directed toward the Project Manager, Tom Bruha, at 894-2400 extension 554.

Written communications should be mailed to:

Division Engineer
U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254

Section 404(b) Factual Determination and Finding of Compliance Small Beach Erosion Control for Lynn-Nahant Beach Lynn, Massachusetts

Department of the Army
New England Division, Corps of Engineers
Waltham, Massachusetts

July 1981

Section 404(b) Factual Determination
and Finding of Compliance
Beach Erosion Control for
Lynn-Nahant Beach
Lynn, Massachusetts

1. References

a. Section 404(b) of Public Law 92-500, Clean Water Act.

b. 40 CFR Part 230 Subparts B, C, D, E, F, G and H dated 24 December 1980.

c. EC 1105-2-90 Appendix C, dated 8 May 1979.

2. The Proposed Project

The recommended plan calls for approximately 185,000 cubic yards of suitable sandfill to be placed along 2,600 feet of the Lynn-Nahant beach between Woodbury's Point and the dune on the Nahant tombolo. This proposed sandfill is designed to extend seaward to approximately the existing mean low water line (see attached drawing). This project also includes annual periodic nourishment to be cost shared equally. The fill material will originate from an appropriate inland site in Massachusetts.

There is also the possibility of either groin or revetment construction, at a later date. The top of the groin will be constructed at or just below the proposed sandfill, and will extend 400-500 feet from the existing backshore seawall. The revetment, if constructed, will follow the contour of the Woodbury's Point seawall. It will consist of either a single or triple layer of rock and is designed to reduce reflection of the incoming waves off the vertical seawall.

3. Project Authority

Project authority is conferred by the provision of Section 2 of the River and Harbor Act approved 3 July 1930 and Public Law 166, 79th congress, approved 31 July 1945.

4. Environmental Concerns

As proposed, the project will have minimal temporary impacts on the local aquatic environment. No significant or persistent adverse impacts are expected for several reasons. For further information on temporary impacts refer to the Environmental Impact Report put out by the State of Massachusetts, which will be issued in draft separately.

a. Sandfill material will be clean, free of any harmful contaminants and composed of naturally occurring sands from a suitable Massachusetts inland site.

b. Impacts associated with construction including increased turbidity, reduced light transmission and lowered photosynthetic rates are expected to be temporary since materials with large particle sizes, such as sand, settle rapidly when disturbed or discharged.

c. All fill material will be compatible with the existing beach-fill. This will allow the present biological community to begin reestablishing shortly after construction is completed.

d. While construction activities are expected to destroy benthic organisms inhabiting the immediate work area no known significant fish or shellfish resources would be affected by the project. The offshore shellfish beds would not be impacted by the project unless large amounts of sand migrates from the beach. The fill material to be used will be of high quality and possess very stable characteristics. These characteristics will ensure a slow rate of sand migration to the nearby shellfish beds which will reduce, if not eliminate, any impacts to them.

e. The additional sand will protect the existing seawall from further flood damage. It will also greatly increase the dry beach area allowing for greater use of a valuable recreation area. The additional sand will place a significant portion of the beach out of the range of the tide and improve drainage thereby accelerating drying of the algae. Presently the algae are not drying out which is leading to their decomposition. This in turn is producing a horrendous odor. The additional sand will also keep the algae in a confined area which will significantly facilitate mechanical removal of the algae from the beach.

f. If construction of the groin is implemented, at a later date, some of the intertidal and subtidal habitat will be removed. But the end result will provide a rock/sand interface with greater surface area suitable for colonization, thus allowing greater biological diversity and biomass.

5. Restriction on Discharge (Section 230.10)

There is no practical or economical alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem and be capable of achieving the basic purpose of the proposed project. A "no action" alternative is not by definition practical since this would allow continued erosion of a public beach, deterioration of the seawall, and the eventual loss of a recreational area.

6. Find of Compliance (Section 230.12)

a. On the basis of these guidelines (subparts C through G) the proposed disposal site for the discharge of fill material has been specified as complying with the requirements of these guidelines.

b. The factual determinations required by section 230.11 are presented on page 4.

7. Conclusions

Determinations

a. An ecological evaluation has been made following guidance in 40 CFR 230, Subparts B through G. In addition, Subpart H was reviewed to determine applicability to the proposed project.

b. Appropriate measures have been identified and incorporated in the proposed plan to minimize adverse effects on the aquatic environment as a result of the discharge.

c. Consideration has been given to the need for the proposed project, the availability of alternate sites and methods of disposal that are less damaging to the environment, and such water quality standards as are appropriate and applicable by law.

d. In order to provide beach erosion control along Lynn-Nahant beach, clean fill will be placed in and along the shoreline.

Findings

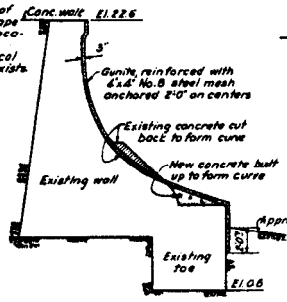
The proposed discharge site for the proposed beach erosion control project at Lynn-Nahant beach has been specified through the application of the Section 404(b)(1) Guidelines.

The project files and Federal regulations were reviewed to properly evaluate the objectives of Section 404 of Public Law 92-500. A public notice with respect to the 404 Evaluation will be issued accompanying this document. Based on information presented in the 404 Evaluation, I find that the project will not result in unacceptable impacts to the environment.

24 July 1981
DATE

C. E. EDGAR, III
Colonel, Corps of Engineers
Division Engineer

NOTE
Existing toe does not extend entire length of wall and varies in shape and size at various locations.
Sections show typical conditions where toe exists.



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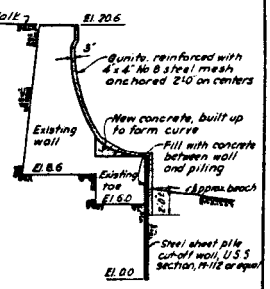

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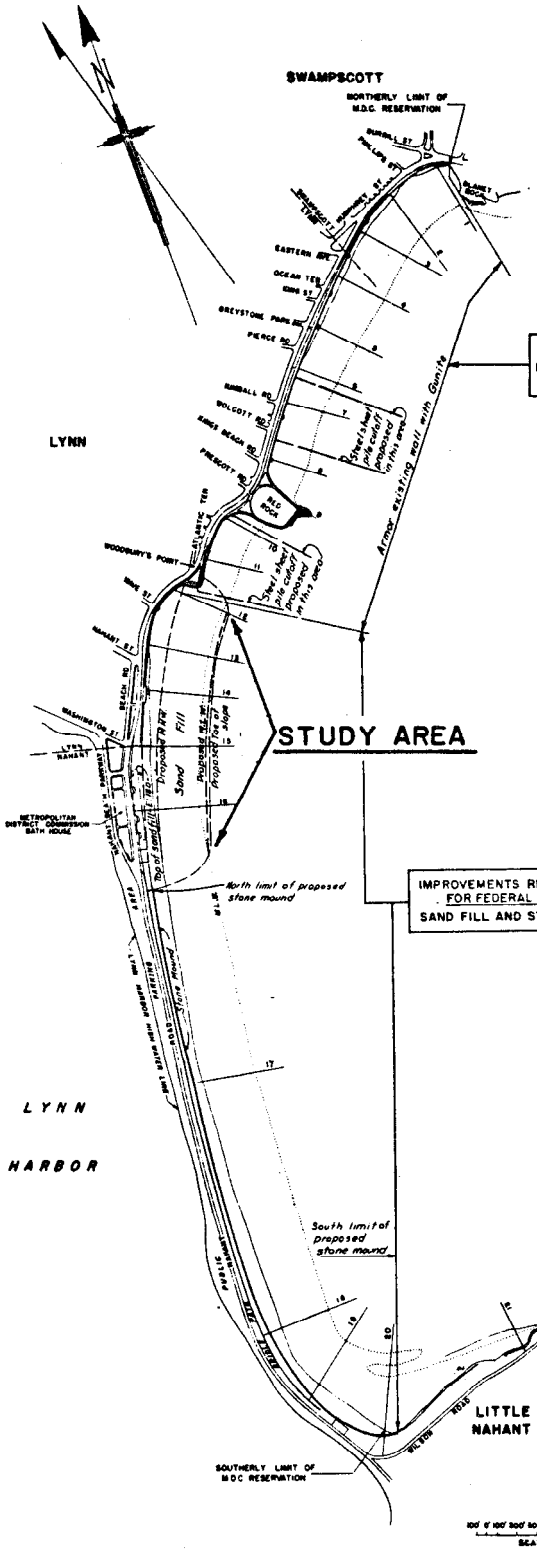
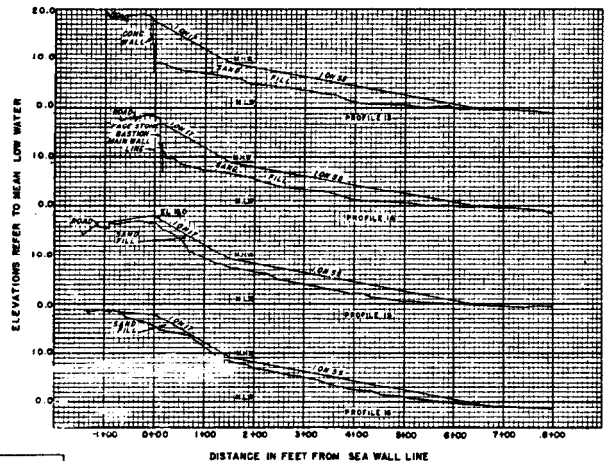
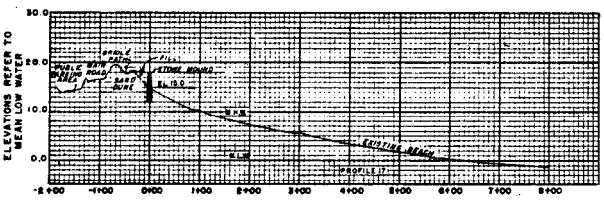


IMPROVEMENT RECOMMENDED
MAINTENANCE OF EXISTING WALL BY LOCAL INTERESTS

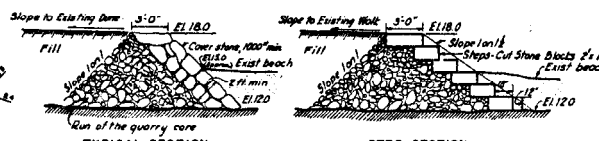
IMPROVEMENTS RECOMMENDED FOR FEDERAL PROJECT
SAND FILL AND STONE MOUND



TYPICAL SECTIONS OF SAND FILL



LOCATION OF STONE MOUND
TYPICAL SECTION AT PROFILE 17



DETAILS OF STONE MOUND
SCALE 1/4" = 1'-0"

NOTE
Steps required at 2 locations to provide access to fireplaces and tables at base of sand dunes.

NOTES
All elevations refer to Mean Low Water.
Beach profiles from survey by Corps of Engineers, Oct-Dec 1945 and May 1946.
Nahant Road and Public Parking Area was reconstructed in 1947, and relocated so that Public Parking Area is adjacent to sand dune.

To Accompany Report Dated: June 1, 1948

WAR DEPARTMENT
CORPS OF ENGINEERS
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION, BOSTON, MASS.

DRAWN BY PDM	METROPOLITAN DISTRICT COMMISSION
TRACED BY PDM	BEACH EROSION STUDY
CHECKED BY	PLANS OF PROTECTION
SUBMITTED BY	LYNN-NAHANT BEACH
APPROVED	MASSACHUSETTS
APPROVED	MAY 31, 1948
	SCALE AS SHOWN
	DRAWING NUMBER 52 F-15-2

PLATE NO. A-6

Factual Determination
of
Potential Effects from the Proposed
Discharge of Fill Material Along
Lynn-Nahant Beach
Lynn, Massachusetts

230.11 (a) Physical Substrate Determination

The proposed disposal site will not undergo any significant change in the characteristics of the substrate due to the proposed construction. The fill material will be predominantly sand and compatable to the existing beach. The sandfill will come from a suitable inland site in Massachusetts.

If a groin is to be constructed, at a later date, it will change the existing sandy substrate to one of rock. The resulting rock/sand interface is expected to provide a more stable and diverse habitat for benthic organisms and should result in increased biomass.

(b) Water Circulation, Fluctuation, and Salinity Determination

Current patterns, circulation and normal water fluctuation will not be altered in such a manner as to result in adverse affects to the environment. If construction of the groin is implemented, at a later date, the long shore net movement of both water and sand along Lynn-Nahant Beach will be interrupted. This should cause a significant reduction in erosion to the beach as well as provide a stable habitat for benthic organisms residing along the shoreline and on the groin itself.

Impacts on the water chemistry, salinity, clarity, color, odor, taste, dissolved gas levels and temperature should be minimal. The reason being the large particle size of the fill material and the fact that the material will be free of contaminants.

(c) Suspended Particulate/Turbidity Determination

As a result of construction, a temporary minimal increase in suspended particulate and turbidity levels is expected. Due to the large grain size of sand it settles rapidly thus no problem is anticipated. Also since surf zones are areas of high energy and have naturally high suspended sediment loads, it is possible increased levels due to construction will go unnoticed.

(d) Contaminant Determination

All material proposed for discharge will be clean. It will come from a suitable inland site in Massachusetts and will be free of harmful contaminants that might adversely impact the aquatic environment or render the beach unsuitable for human use.

(e) Aquatic Ecosystem and Organism Determination

Slow moving or immobile organisms inhabiting the immediate construction area are expected to be destroyed. Widening the beach will extend seaward the tide line, effectively removing the once intertidal substrate from the aquatic environment. However, once construction is completed the "new" intertidal area will be suitable for establishment by the previous community with nearby communities providing recruitments for colonization. In addition, if a groin is constructed, at a later date, it should increase the diversity and biomass by providing a more stable environment along the shoreline by decreasing erosion.

(f) Proposed Disposal Site Determinations

Not applicable. This section addresses the acceptability of and impacts associated with mixing zones. Mixing zones apply to open water disposal techniques. No open water disposal of fill material will occur in conjunction with the proposed project.

(g) Determination of Cumulative Effects on the Aquatic Ecosystem (1 and 2)

No known Federal, State or local action has taken place except for periodic beach nourishment. The last nourishment program took place in 1973 and it hasn't caused any adverse impacts to the aquatic environment. Therefore, no cumulative impacts resulting from the proposed project are expected at or near Lynn-Nahant Beach.

(h) Determination of Secondary Effects on the Aquatic Ecosystem

Possible secondary impacts associated with construction might include interference with spawning or reproductive processes of fish and shellfish. In order to avoid this problem, construction will occur during the fall and early spring months.

Finding of No Significant Impacts

The proposed Beach Erosion Control Project at Lynn-Nahant Beach, Lynn, Massachusetts, will provide for the placement of between 170,000-200,000 cubic yards of clean sandfill as well as the possibility of constructing a rock groin, at a later date, for the purpose of erosion control.

The impacts associated with this project are threefold. First, a recreational beach of sufficient size will be created and maintained. Second, organisms inhabiting the project area will not be severely impacted. Repopulation of the communities is expected to occur upon project completion. Also, the offshore shellfish beds will not experience adverse effects because the sandfill will be composed of a large grain size which adds to its stability. Thus, a minimal amount will migrate from the beach to these shellfish beds. Third, the amount of turbidity will be small and thus its effects on the oxygen level and photosynthetic processes of plankton will be insignificant. (See Environmental Impact Report prepared by MDC of Massachusetts, August 1981.)

To comply with National Environmental Protection Agency's regulation the Environmental Impact Report, prepared by the Metropolitan District Commission, Commonwealth of Massachusetts, is to be considered an Environmental Assessment. With this in mind, the Army Corps of Engineers has made the determination that the proposed Beach Erosion Control Project will not have any significant impacts which would necessitate the preparation of an Environmental Impact Statement.

28 October 1981
DATE

C. E. EDGAR, III
Colonel, Corps of Engineers
Division Engineer

APPENDIX 2

CONDITIONS OF LOCAL COOPERATION

1. Local sponsor (Commonwealth of Massachusetts) should agree that it will:

a. Prior to commencement of work, obtain approval from the Office of the Chief of Engineers in Washington, DC of the detailed plans and specifications and the arrangements for prosecuting the work on the project.

b. Construct the project at local expense presently estimated at $1,510,000. The Federal share of the cost of construction is 57.7 percent completion of construction.

c. Provide, without cost to the United States, all lands, easements, and rights-of-way necessary for project construction and subsequent maintenance of the project.

d. Maintain continued public ownership of the shore upon which the Federal participation is based and its administration for public use during the 50-year economic life of the project.

e. Hold and save the United States free from all claims for damages that may arise before, during, or after prosecution of the work and subsequent maintenance of the project other than damages due to the fault or negligence of the United States or its contractors.

f. Maintain the protective measures as necessary during the 50-year economic life of the project as may be required to serve their intended purpose by contributing 42.3 percent of the cost of periodic annual sand nourishment for the economic life of the project. The Federal share is 57.7 percent and will be reimbursed to non-Federal interests upon the completion of each nourishment operation.

g. The non-Federal interests shall maintain books, records, documents, and other evidence pertaining to costs and expenses incurred in the performance of the work to the extent and in such detail as will properly reflect all net costs of whatever nature involved therein. The non-Federal interests shall make available at their offices at reasonable times the accounting records for inspection and audit by an authorized representative of the Division Engineer.

h. The Government shall reimburse the non-Federal interests for its participation upon receipt of properly certified invoices, in quadruplicate, supported by such evidence of payment as may be required by the contracting officer.

i. Report water quality violations to the Division of Water Pollution Control to safeguard the health of the bathers.

j. Comply with the requirements of non-Federal cooperation specified in Section 210 and 305 of Public Law 91-646 approved 2 January 1971 entitled "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970."

k. Comply with Title VI of the Civil Rights Act of 1964 (78 Stat 241) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations.

APPENDIX 3

ENGINEERING ANALYSIS

APPENDIX 3

TABLE OF CONTENTS

LIST OF PLATES

INTRODUCTION

Lynn-Nahant Beach, Lynn-Nahant, Massachusetts, is a very popular recreational beach bathing area which over the years has experienced serious erosion. As a result of this erosion, backshore seawalls have been undermined and damaged. The Commonwealth of Massachusetts Metropolitan District Commission (MDC) owns and operates the beach and over the years has spent considerable time and money maintaining the beach and the backshore structures. The proposed plan of improvement will provide a much needed recreational beach, and with annual periodic nourishment will almost completely eliminate any maintenance to backshore seawalls.

PROBLEM IDENTIFICATION

Several problems exist along this 2,600-foot section of shorefront beach. The primary concern is the lack of adequate dry beach space above the mean high waterline and the continued maintenance of backshore structures damaged by frequent northeast storms that overtop the low-lying beach. The walls are now exposed and experience direct wave attack during normal and spring tide conditions. Waves reflect off the walls, undermining and damaging the structures.

The beach is oriented in an easterly direction facing Nahant Bay and the Atlantic Ocean. Over the years the bay has accumulated a considerable amount of algae that is a primary concern of the adjacent towns. This problem is addressed in the "Environmental Impact Report" prepared by the MDC, and is included in Volume 2.

This algae problem is not related to the proposed plan of improvement or the quality of the environment. We have had samples tested of potential sand sources to assure that the proposed material to be placed on the beach is free of all elements that could accelerate the growth of this algae. Also, MIT Sea Grant has studied the problem but to date cannot identify the source or a solution to eliminate the algae. This problem will not interfere with obtaining a clean water certification or consistency for the Commonwealth of Massachusetts. Advance clean water certification and consistency letters are inclosed in Appendix 5, "Pertinent Correspondence."

ENGINEERING ANALYSIS

The authorized plan of improvement is the most practical and economical plan for the beach. Other plans with and without structures were evaluated. These plans were economical based on our preliminary evaluation. Until a more detailed study or a monitoring program could be undertaken in cooperation with the Commonwealth of Massachusetts, sandfill with nourishment is the most practical plan of improvement.

At this time sandfill and periodic nourishment would be the best engineering solution to this problem. Periodic nourishment with Federal participation and a beach monitoring program will enable us to determine the shoreline processes after construction. This will also assist us in determining the need for any future structural modification.

DESIGN TIDE

The design tide elevation selected for Lynn-Nahant Beach was based on providing protection to the backshore structure from a storm with a tide elevation of 15.0 feet above mean low water (10.5 NGVD). This tide allows 2 feet for wave runup and overtopping and is expected to occur with a frequency of about once in 100 years. This is the authorized stillwater condition that was considered.

DESIGN WAVE

The slope of the proposed beach fill and the resulting stillwater prevent large waves from being supported at the project. Approaching deep water waves cannot be supported in Nahant Bay. Furthermore, because of the depth of the water at and in the vicinity of the toe of the beach, large waves will begin to break approximately 200 to 300 feet seaward of the seawall. Near the mean high waterline and with a stillwater elevation of 15.0 feet MLW (10.5 NGVD) there will be approximately 6.0 feet of water, which could support a wave of approximately 5.0 feet. With this maximum stillwater condition, as suggested in the authorized document, the depth of water will govern the size of wave on the beach face. (See Plate 3-1 and 3-2.) The more frequent northeast storms, which are a serious problem in this area be more damaging than the above-mentioned stillwater elevation and waves. This is discussed in the Environemtnal Impact Report Volume II of this report.

COST SHARING

Lynn-Nahant Beach qualifies in part as a park and satisfies the necessary criteria. Inclosed as part of this appendix is pertinent correspondence relating to this matter. Therefore, the cost between Federal and non-Federal interests for the proposed improvement and periodic nourishment was established at 57.7 percent Federal and 42.3 percent non-Federal.

The currently estimated first cost of the project at the current interest rate of 7 5/8 percent is $1,510,000. The Federal share of this cost is $871,270.

The apportionment of the first cost, annual charges and the cost of periodic nourishment are as follows:

FIRST COST

Sandfill	175,000 cy @ $7.00	$1,225,000
	Contingencies	185,000
	Engineering and Design	75,000
	Supervision and Administraton	25,000
	TOTAL FIRST COST	$1,510,000

COST SHARING

Federal Share	(57.7%)	$871,270
Non-Federal Share	(42.3%)	$638,730

ANNUAL CHARGES

Federal Investment		
Interest - 0.07625 X $871.270		$ 66,500
Amortization 0.00198 X $871.270		1,700
Nourishment 4,000 cy @ $8.00		32,000
	Federal Charges	$100,200
Non-Federal Investment		
Interest - 0.07625 X $638.730		$ 48,700
Amortization 0.00198 X $638.730		1,300
Nourishtment 3,000 cy @ $8.00		24,000
	Non-Federal Charges	$ 74,000
	TOTAL ANNUAL CHARGES	$174,200

ANNUAL BENEFITS

Average Annual Benefit	$255,000
Reduced Maintenance	47,000
	$302,000

BENEFIT TO COST RATIO

First Cost	$1,510,000
Total Annual Charges	$174,200
Total Annual Benefit	$302,000
Benefit-Cost Ratio	1.73

ENGCW-PD (28 Feb 62) 1st Ind

SUBJECT: Lynn Beach, Massachusetts

Office of the Chief of Engineers, Washington 25, D. C. , 10 April 1962

TO: Division Engineer, U. S. Army Engineer Division, New England
WALTHAM, MASSACHUSETTS

Referred for:

☒ Direct reply, copy to OCE.

☐ Information as basis for further reply to reach this office by _____ ATTN: _____

☐ Information for this office.

☐ Your information and consideration.

☐ Attention invited to inclosed copy OCE reply dated _____.

☐ Correspondent not informed of reference.

☐

FOR THE CHIEF OF ENGINEERS:

ROBERT C. MARSHALL
Colonel, Corps of Engineers
Assistant Director of Civil Works
for Eastern Divisions

NOTE: Reply sent to Mrs. E.A.Paine, 17 Beach Road, Lynn, Mass.

ENGCW (28 Feb 62) 2d Ind Mr. Perdikis/ra/554

U. S. Army Engr Div, Waltham, Mass. 19 April 1962

TO: Chief of Engineers, ATTN: ENGCW-PD, DA, Wash., D.C.

1st Ind complied with; copy of letter inclosed.

1 Incl
ENG FL No. 9, 1 Jun 58

OTTO J. ROHDE
Colonel, Corps of Engineers
Acting Division Engineer

cc: Mrs. M. Thompson
Mr. Leslie Mr. Dingwall
Mr. Fogarty Engr Div file ✓

G12594

ENGBE-PD 12 April 1963

SUBJECT: Recomputation of Federal Share of Authorized BEC Projects

TO: Division Engineer
U. S. Army Engineer Division, New England
424 Trapelo Road
Waltham 54, Massachusetts

Reference is made to your recomputation for Lynn-Nahant Beach, Massachusetts furnished by letter of 26 February 1963. It is noted that a portion of beach fill under this project fronts a seawall and road as pointed out in the inclosure hereto. Your comments on the recomputation proposed in that inclosure are requested to reach this office on or before 19 April 1963, so that they may be presented at the next Board meeting.

FOR THE PRESIDENT:

1 Incl
as

MILTON E. STEVENS
Lt. Colonel, CE
Executive

NEDGW (12 Apr 63) 1st Ind Mr. Perdikis/re/554

U. S. Army Engr Div, New England, Waltham 54, Mass. 16 April 1963

TO: The President, Beach Erosion Board, ATTN: ENGBE-PD, Wash., D.C.

Private development is located on the land side of the seawall and shore road from Washington Street northward for about 1600 feet to Woodbury Point. The width of the buffer zone from the high water line back to the landward side of the shore highway at Washington Street is approximately 300 feet and it decreases to about 150 feet at Woodbury Point. This office concurs in the method of computation of the new percentages of Federal cost-sharing.

1 Incl
nc

P. C. HYZER
Brigadier General, USA
Division Engineer

cc: Div Engr file
Mr. Leslie Mr. Hill
Mr. Fogarty Opers Div
Engr Div file w/cy incl

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P. C. HYZER
Brigadier General, USA
Division Engineer

cc: Div Engr file
Mr. Leslie Mr. Hill
Mr. Fogarty Opers Div
Engr Div file w/cy incl

C O P Y

Lynn-Nahant Beach, Mass.

Information submitted by the Division Engineer on this project was furnished to Board Members by Memo of 5 April 1963. The staff then recommended approval of the proposed 70% Federal share. It has subsequently been found that the project includes a section about 1,600 feet long north of Washington Street where the proposed beach is in front of a seawall and street, back of which it is believed there is private development. This does not appear to comprise a buffer zone of adequate depth to qualify the project for 70% Federal share for this section. Accordingly the staff recommends only 50% Federal share for this section, about 1,600 feet long, subject to receipt of additional information from the Division Engineer.

Recomputing Federal share as $\left(\frac{1600}{2600} \times 50 + \frac{1000}{2600} \times 70 \right)$ % or 57.7% of the cost of fill and 70% of the cost of the stone mound results in a total recomputed Federal share of $403,000 or 62.2%.

ENGBE-PD (26 Feb 1963) 1st Ind
SUBJECT: Recomputation of Federal Share for Authorized Projects.

Beach Erosion Board, Corps of Engineers, Washington, D. C. 26 April 1963.

TO: Chief of Engineers, Department of the Army, Washington, D. C.
ATTN: ENGCW-PD

1. The Beach Erosion Board considered subject projects at its meeting of 23 April 1963. The Board recommends approval of recomputation of costs as follows:

Hampton Beach, N. H. - Substitute 1/2 for 1/3 of the cost of remaining work.

North Hampton Beach, N. H. - Substitute 1/2 for 1/3 resulting in a composite percentage of 35.3%.

Winthrop Beach, Mass. - Substitute 1/2 for 1/3 for remaining work.

Wessagussett Beach, Mass. - Substitute 1/2 for 1/3 for remaining work.

North Scituate Beach, Mass. Substitute 1/2 for 1/3.

Brant Rock, Mass. - Substitute 1/2 for 1/3

Town Neck Beach, Mass. - Substitute 1/2 for 1/3 for work other than raising existing Federal jetty which is entirely at Federal expense as before.

Thumpertown Beach, Mass. - Substitute 1/2 for 1/3.

New Bedford, Mass. - Substitute 1/2 for 1/3.

Provincetown Beach, Mass. - Substitute 70% for 1/3.
Misquamicut Beach, R. I. - Substitute 70% for 1/3

Greenwich Point, Conn. - Substitute 1/2 for 1/3. In this case the Board did not concur in the opinion that the park meets the criteria as a park and conservation area eligible for 70%, as the Board believed that the park meets the criteria as a park and conservation area except with regard to its availability for public use, since such use is restricted to town residents and guests.

The 70-percent Federal shares would be subject to a requirement that the parks continue to meet the criteria for parks and conservation areas specified in PL 87-874.

3

ENGBE-PD (26 Feb 63) 26 April 1963
SUBJECT: Recomputation of Federal Share for Authorized Projects.

2. The Board deferred action on the recomputation for Lynn-Nahant Beach, Mass. as insufficient information was available for determination of the Federal share under PL 87-874. The recomputation for Wallis Sands Beach, N. H. is being sent by separate correspondence.

FOR THE BOARD:

14 Incl nc

MILTON E. STEVENS
Lt. Colonel, CE
Executive

ENGCW-PD (26 Feb 63) 2d Ind
SUBJECT: Recomputation of Federal Share of Authorized Projects

Office, Chief of Engineers, Washington 25, D. C., 2 May 1963

TO: Division Engineer, U. S. Army Engr Div, New England, Waltham, Mass.

1. The Chief of Engineers in accordance with Section 103c of the River and Harbor Act (PL 87-874) approved 23 October 1962, approves the recomputation of the Federal share of the estimated costs of remaining work on authorized beach erosion control projects, as recommended by the Beach Erosion Board in 1st indorsement ENGBE-PD (26 Feb 63) dated 26 April 1963, above subject, subject to the following comments and additional actions.

2. The recomputation of the Federal share of the estimated costs is to be adjusted for final settlement based on actual costs incurred. Supplemental agreements on the recomputed sharing of costs should be secured from local interests updating the original agreements or and assurances of local cooperation for these projects. For those projects found to warrant up to 70 percent Federal participation, no Federal funds are to be disbursed until local interests have furnished additional satisfactory assurances indicating that they will meet the criteria specified in Public Law 87-874 for conservation and park areas. Copies of the modified agreements should be furnished this office.

FOR THE CHIEF OF ENGINEERS:

Incls w/d

JACKSON GRAHAM
Brigadier General, USA
Director of Civil Works

5

Basic Letter filed in Beach Erosion Gen. File

Mr. Hovsesian/ra/554

NEDGW (26 Feb 63) 3rd Ind
SUBJECT: Recomputation of Federal Share of Authorized Projects

U. S. Army Engr Div, New England, Waltham, Mass. 4 June 1963

TO: The President, Beach Erosion Board, 5201 Little Falls Road, N.W., Washington 16, D. C.

1. In accordance with 1st and 2nd indorsements to basic letter, additional information is supplied for determination of the percentage of Federal cost-sharing in the authorized project at Lynn-Nahant Beach, Mass.

2. In addition to protecting the mainland from wave attack, as described in basic letter, the tombolo acts to protect Lynn Harbor and the Federal navigation project there. This project is described and shown on the inclosed project sheet and map. A project sheet and map of Lynn-Nahant Beach also is supplied.

3. A field inspection was made on 17 May 1963. Photographs were taken of the beach and its facilities. The inclosed plan of the beach, Plate A-1, shows the existing facilities and adjoining development.

4. At the Beach section south of Washington Street, the following beach facilities, as shown on the plan, are available to the general public:

a. A large and complete bathhouse
b. 20 Outdoor fireplaces with tables and drinking fountains
c. Sanitary facilities for bathers
d. Beach shelters
e. Recreation and game areas
f. Parking areas along the entire beach
g. A paved walk about 10 feet wide, named the "Bridle Path", which extends the entire length of the beach.
h. Since the date of the original beach erosion control report on Lynn-Nahant, a new 45-foot wide road to Nahant has been constructed along the Lynn Harbor side of the tombolo, parallel to the Old Nahant Road, which now serves as a limited access beach road. This new road is sketched on the inclosed plan.

5. The width of the tombolo varies from about 300 to 450 feet between mean high water lines. The sand dunes, which are the highest natural features on the tombolo, range in elevation from about 18.0 to 21.0 feet above mean low water.

6. North of Washington Street up to Woodbury Point, the development on the land side of the beach road is residential, consisting of private homes, apartment houses, and tourist houses. This development lies 160 feet landward of the fronting sea wall at Washington Street and decreases to 80 feet at Woodbury Point. The area between the development and sea wall consists of sidewalks, roadways, traffic islands, and grass plots.

NEDGW (26 Feb 63) 3rd Ind 4 Jun 63
SUBJECT: Recomputation of Federal Share of Authorized Projects

7. There has been recent State and Congressional interest in construction of the project. Representative Torbert H. MacDonald of the 7th Massachusetts District recently made an inquiry to the cooperating agency, the Metropolitan District Commission, concerning the status of the project. A bill has been introduced in the Mass. Legislature for appropriation of funds for construction. It is believed that the approval by the Beach Erosion Board prior to its next meeting of the recomputation of cost sharing would facilitate State plans for project construction.

Added 4 Incl
15. Proj. Map/Sheet Lynn Hbr
16. " " " Lynn-Nahant Beach
17. Photos (21)
18. Gen. Plan (Plate A-1)

OTTO J. ROHDE
Colonel, Corps of Engineers
Acting Division Engineer

cc: Div Engr file
Mr. Leslie
Mr. Hill
Mr. Fogarty
Opers Div
Engr Div file

NEDGW

23 October 1963

Mr. Robert F. Murphy, Commissioner
Metropolitan District Commission
20 Somerset Street
Boston, Massachusetts

Dear Mr. Murphy:

The River and Harbor Act of 1962, Public Law 87-874, 87th Congress, approved 23 October 1962, authorized and directed the Chief of Engineers, through the Beach Erosion Board, to recompute the amounts of Federal contribution towards the costs of authorized beach erosion control projects, the construction of which had not been substantially completed prior to the date of approval of the Act.

The Federal share of the work on the project for Lynn-Nahant Beach, which has not been constructed, accordingly has been recomputed and approved by the Chief of Engineers as follows:

a. One-half instead of one-third for the portion of the beach fill plan north of Washington Street (1600 feet) and 70% instead of one-third for the portion of the beach fill plan south of Washington Street (1,000 feet). The recomputed Federal share for the beach fill would be therefor -

$$\frac{1600}{2600} \times 50\% + \frac{1000}{2600} \times 70\% = 57.7\%$$

b. 70% instead of one-third for the stone mound portion of the project.

The estimated total cost of the project is $648,000 and the estimated Federal share of this cost is $403,000. The actual Federal share will be 57.7% of the actual cost of the beach fill and 70% of the actual cost of the stone mound.

It is required prior to disbursement of Federal funds for this project that satisfactory assurances in addition to those already furnished be executed, indicating that Lynn-Nahant Beach will continue to meet the criteria for parks and conservation areas specified in Public Law 87-874. A new agreement containing these assurances will be furnished for execution prior to construction of the project.

Sincerely yours,

OTTO J. ROHDE
Colonel, Corps of Engineers
Acting Division Engineer

cc: Div Engr file
Mr. Leslie
Mr. Hill
Mr. Fogarty
Opers Div
Engr Div file w/5th Ind 10 Oct 63 w/incl

cc: Mr. Connors, R.E.

as

7

(617) 359-8945

(617) 359-8560

CHILDS ENGINEERING CORPORATION
WATERFRONT AND STRUCTURAL ENGINEERING

BOX 333
MEDFIELD, MASSACHUSETTS 02052
U.S.A.

October 27, 1981

Mr. Henry Higgott
Metropolitan District Comm.
20 Somerset Street
Boston, MA 02108

Re: Lynn - Nahant Shore Protection

Dear Henry:

Please find attached five (5) copies of the contract documents as you requested and as required by our contract. It should be noted that the following items must be completed prior to advertisement:

Date of Bid Opening, Project Value and Bid Security Amounts, Updated State Wage Rates, DEQE File Number.

Enclosed with this letter is a copy of our final cost estimate based on proposed spring 1982 construction start up. The estimate includes a suggested construction contingency of five (5%) percent. It should be noted that the selected price ($10.00 per cubic yard) for the sandfill work is higher than the price currently used by the Corps of Engineers ($7.00 per cubic yard). Our figure is based on a sampling of eleven (11) sources. The average price of those sources was $11.80 per cubic yard. However, we feel that the sources in the competitive range are between $6.00 and $11.60 per cubic yard. We feel that $10.00 per cubic yard will insure that sufficient funds are available in the budget to accomplish the work. We have provided this explaination so you will be able to discuss the apparent unit price differences with the Corps of Engineers.

If you have any questions, please call our office.

Respectfully submitted,

David L. Porter, P.E.
Vice President

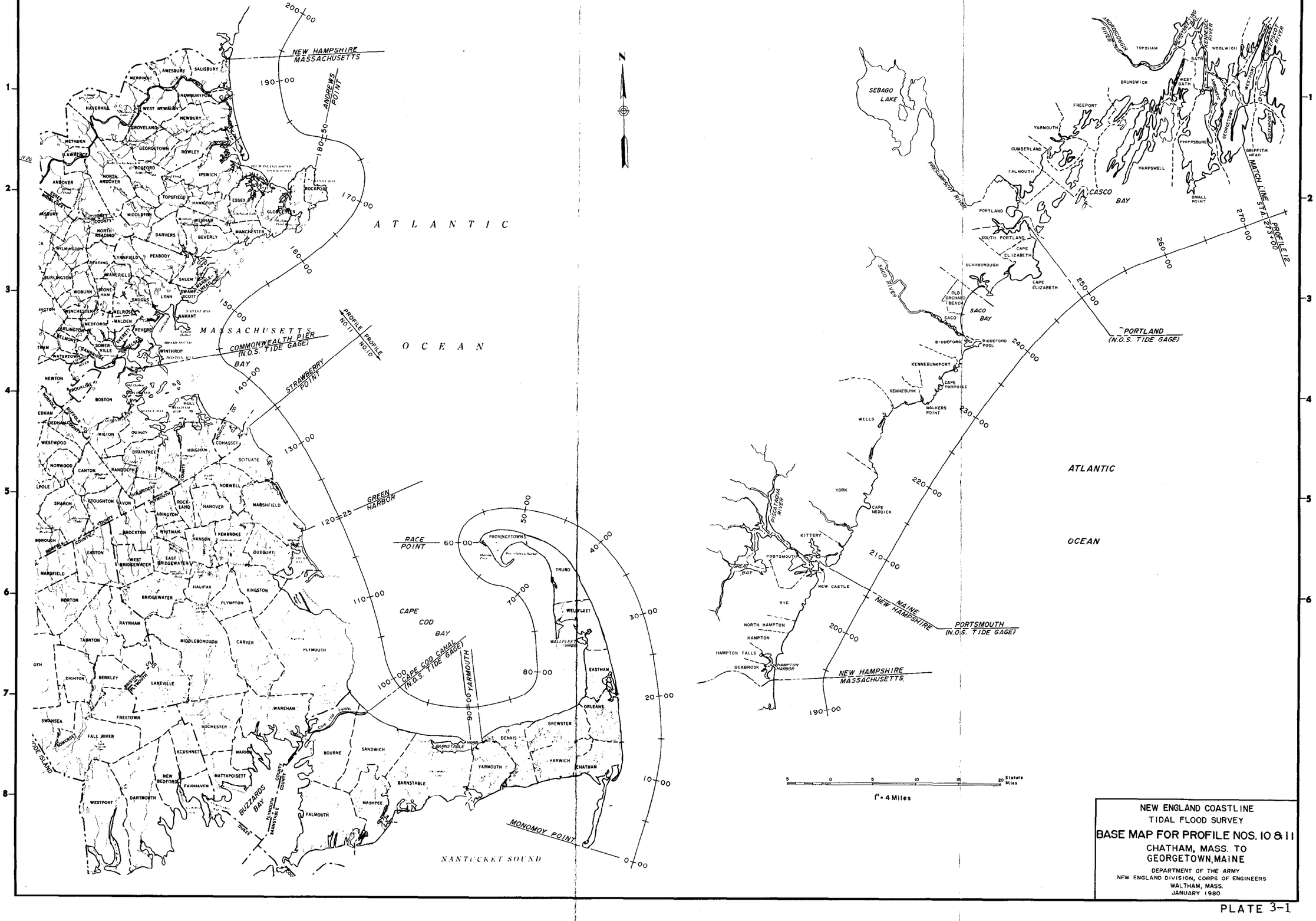
encls: 6
DLP/jfk

	Estimated Quantities	Computed Totals
Item 1 - Removal of bituminous concrete and cement concrete pavement For the lump sum of .....dollars	-	$...4,500
Item 2 - Seawall Removal For the sum of .....dollars and.....cents per linear foot ($..... per linear foot)	45	$...2,520
Item 3 - Removal of precast concrete blocks For the lump sum of .....dollars	-	$...3,300
Item 4 - Sandfill Construction For the sum of .....dollars and.....cents per cubic yard ($.10.00..... per cubic yard)	175,000	$1,750,000.
Item 5 - Precast concrete unit sand barrier For the sum of .....dollars and.....cents per each ($ 300.00..... per each)	84	$..25,200
Item 6 - Seawall For the sum of .....dollars and.....cents per linear foot ($ 200.00..... per linear foot)	128	$..25,600
Item 7 - Sidewalk For the sum of .....dollars and.....cents per square yard ($140.00..... per square yard)	110	$..15,400
Item 8 - Drain Extensions For the lump sum of .....dollars	-	$..34,000
TOTAL CONTRACT BID PRICE		$1,860,520
Construction Contingencies (5%)		$ 94,480
Budget Total		$1,955,000

Final Cost Estimate
October 30, 1981

CORPS OF ENGINEERS

U. S. ARMY



NEW ENGLAND COASTLINE
TIDAL FLOOD SURVEY

BASE MAP FOR PROFILE NOS. 10 & 11

CHATHAM, MASS. TO
GEORGETOWN, MAINE

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.
JANUARY 1980

PLATE 3-1

CORPS OF ENGINEERS — U. S. ARMY

BOSTON HARBOR | STRAWBERRY PT. | COMMONWEALTH PIER N.O.S. TIDE GAGE | ROCKPORT HARBOR | ANDREWS POINT | MASSACHUSETTS NEW HAMPSHIRE | PORTSMOUTH HARBOR-NEW HAMPSHIRE N.O.S. TIDE GAGE MAINE | YORK HARBOR | CAPE PORPOISE | PORTLAND N.O.S. TIDE GAGE | GRIFFITH HEAD

SACO BAY | CASCO BAY

100 YEAR FREQUENCY TIDAL FLOOD
FEBRUARY 1978 TIDAL FLOOD
50 YEAR FREQUENCY TIDAL FLOOD
10 YEAR FREQUENCY TIDAL FLOOD
JANUARY 1978 TIDAL FLOOD

AMELIA EARHART DAM
CHARLES RIVER DAM
BOSTON TIDE GAGE
PORTLAND TIDE GAUGE

MEAN HIGH WATER LEVEL(1)
MEAN LOW WATER LEVEL(1)
NATIONAL GEODETIC VERTICAL DATUM(2)

ELEVATION IN FEET ABOVE NGVD

STA. 135+50 PROFILE 10 — MATCH LINE
STA. 273+00 PROFILE 12 — MATCH LINE

STATUTE MILES FROM MONOMOY POINT, CAPE COD

135 140 150 160 170 180 190 200 210 220 230 240 250 260 270 275

LEGEND:

◇ 7 FEBRUARY 1978 HIGH WATER
⊕ 9 JANUARY 1978 HIGH WATER
⊙ 2 FEBRUARY 1976 HIGH WATER
66 NUMBER IDENTIFIES HIGH WATER MARK AS GIVEN IN OFFICE RECORDS

NOTES:

1. VARIES FROM YEAR TO YEAR. VALUE GIVEN HERE BASED ON 19-YEAR SERIES OF TIDE OBSERVATIONS ENDING IN 1959, BY THE NATIONAL OCEAN SURVEY (FORMERLY USC & GS).
2. A FIXED REFERENCE ADOPTED AS A STANDARD GEODETIC DATUM FOR ELEVATIONS IN THE UNITED STATES OF AMERICA. FORMERLY REFERRED TO AS MEAN SEA LEVEL (M.S.L.) DATUM, BUT NOT TO BE CONFUSED WITH LOCAL MEAN SEA LEVEL.

5 0 5 10 15 20 STATUTE MILES

NEW ENGLAND COASTLINE
TIDAL FLOOD SURVEY

TIDAL FLOOD PROFILE NO. 11

COHASSET, MASS. TO
GEORGETOWN, MAINE

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.
JANUARY 1980

REVISED 11-20-80

PLATE 3-2

APPENDIX 4

BENEFIT ANALYSIS

APPENDIX 4

TABLE OF CONTENTS

I. Introduction

The purpose of the study is to investigate the feasibility and advisability of modifications to halt beach erosion at Lynn Beach in Lynn, Massachusetts. The proposed project would involve improving the beach between Woodbury's Point and the dune on the Nahant tombolo, a distance of 2,600 feet, by placing 200,000 cubic yards of sand on the beach. The result would be a back-shore elevation of 18.0 feet above mean low water and the creation of an additional 260,000 square feet of beach space.

II. The Study Area

The city of Lynn and the town of Nahant will be most affected by the proposed project. They are located in Eastern Massachusetts on the northern shore of Massachusetts Bay. Lynn's 10.48 square miles of land are bordered on the east by 8.3 miles of Atlantic Ocean shoreline and the town of Swampscott, on the west by Saugus and Lynnfield, on the north by Peabody and Salem and on the south by Revere and Nahant. Nahant is a penninsula jutting south of Lynn and has a land area of 1.04 square miles. Both Lynn and Nahant are located in Essex County, Massachusetts.

Population

Figures from the 1975 Massachusetts state census show Lynn having a population of 80,240 and Nahant with 4,229. Population trends in Lynn, which is an industrialized, commercialized city constrast sharply with trends in Nahant, which is a residential-type town. Over the past fifty years, a continuous pattern of population decline has existed in Lynn while at the same time, the population of Nahant has grown slowly to a point where it is expected to level off. Population trends for the area are shown in Table 1.

Lynn's population decline has been due to problems which are common to many urban areas. A weakening economic base, a high property tax, and inadequate municipal services have hurt the city. Nahant's population growth has been due greatly to a net migration balance in favor of persons moving in into the town. Since the amount of housing that can be built or converted in Nahantis limited, Nahant's population is projected to reach a peak by 1990. Lynn, on the other hand is projected to show a further decline in population.

TABLE 1

POPULATION IN LYNN AND NAHANT

YEAR	Population of Lynn	Population of Nahant
1930	102,320	1,654
1940	98,123	1,835
1950	99,738	2,679
1960	94,478	3,960
1970	90,294	4,119
1975	80,240	4,229
1985 *	78,400	4,600

Spurce: U.S. Census
State Census
Lynn Chamber of Commerce

* projection

Employment and Income

Because Nahant is a residential suburb and contains few manufacturing or commercial establishments, dicussion in this section will center on Lynn. Manufacturing has long been the foundation of Lynn's economy. The shoe industry was a significant manufacturing activity until the 1950's when unfavorable wage-level comparisons with other areas and new technology led to its decline in Lynn. The manufacturing sector of the city has become sufficiently diversified to survive the decline of the shoe industry. Leather, machinery, light bulls, fabricated metal products, food, clothing, paper products and chemicals are among the materials produced in Lynn. The General Electric Company is the city's leading manufacturer and currently employs around 13,000 people, including 200 residents of Nahant.

Table 2 lists categories of employment in Lynn. The table shows that around 50% of the jobs in the city are in the manufacturing sector. Manufacturing employment has been declining however. During the years 1967-1978 employment in this sector fell from 23,809 to 15,799, a decline of 8,010 jobs in 9 years. The manufacturing jobs that do exist in Lynn tend to be of higher quality than those in comparable cities.

In addition to manufacturing, a variety of industry sectors offer employment in Lynn. Wholesale and retail trades combine to provide around 20% of the job market. Retail trade has declined in recent years due to competition from retailers in Boston, modern shopping malls in Saugus, Peabody, and Danvers, and a decreasing population in Lynn.

Other categories shown in Table 2 which employ significant numbers of people are construction, finance, insurance, real estate, transportation, communiciations, utilities, government and service industries. Figures in Table 2 represent employment offerings in Lynn, rather than employment of the city's residents.

Once again, it should be stated that Nahant has little industry. The town provides only approximately 350 full-time jobs. Residents of Nahant depend largely on employment in the surrounding urban centers and the technology-oriented businesses between routes 128 and 495. Nahant provided only 1/5 as many jobs as its total number of employed residents in 1970.

Lynn employs a larger number of people than the number of employed residents of the city. Although approximately 8,000 Lynn residents seek employment outside the city, around 9,000 residents of neighboring communities including Nahant, find employment in Lynn. Unemployment rates for Lynn and Nahant are similar to rates in similar cities in Massachusetts. For the May 1980 the unemployment rate in Lynn was 6.3% and in Nahant it was 5.8%.

Lynn does not compare favorably with Nahant or other areas in the state in regard to family income. A relatively high percentage of Lynn residents fall into the lower income brackets. The situation is just the opposite for Nahant, where both the median income and per capita income are higher than the state average.

TABLE 2

COVERED EMPLOYMENT BY INDUSTRY

CITY OF LYNN

	1971	1972	1973	1974	1975	1976	1977	1978
Total Employment	37,061	38,172	37,476	36,852	31,879	32,073	31,544	32,494
Agr., Forestry, Fishing	41	40	30	36	53	32	25	29
Mining	0	0	0	0	0	0	0	0
Contract Construction	908	818	755	727	584	570	578	643
Manufacturing	20,370	18,873	19,424	18,382	16,670	16,343	15,668	15,799
Trans., Comm., Utilities	3,550	4,409	4,639	4,517	1,502	1,502	1,429	1,430
Wholesale, Retail Trade	7,640	7,396	6,503	6,518	6,338	6,338	6,520	6,752
Finance, Insurance, Real Estate	1,269	1,294	1,001	983	1,038	1,038	1,160	1,118
Services	3,283	5,342	5,126	5,689	5,694	5,694	6,164	6,723

Spurce: Massachusetts Division of Employment Security

Housing

The majority of Lynn's population, (about 83%) is housed in structures dating back before 1939, many of which are in need of revitalization. A total of 3.6% of the occupied units are classified as substandard. Another 5.8% are classified as overcrowded.

Most of Nahant's land is devoted to residential usage. Although 71% of the houses date back before 1939, most are very desirable and in excellent condition. For many years Nahant was a summer resort town. In recent years this has changed. Many seasonal dwellings have been converted to year-round use and it is expected that in the not-too distant future the summer home in Nahant will be virtually non-existant.

In Lynn, one-unit structures predominate and constitute 35 percent of total dwellings structures. Various types of multi-unit dwellings account for the remaining occupied units. In Nahant 70% of the structures are one-unit dwellings. These facts again serve to point out the suburban nature of Nahant and the urban nature of Lynn. Lynn's greater percentage of multi-unit structures can in part be accounted for by the need for city rental units. In fact, according to the 1970 U.S. Census, over 50% of the 31,000 housing units is Lynn were listed as renter occupied.

The Metropolitan Area Planning Council (MAPC) estimated in 1973 that 1,928 units of federal or state housing existed in Lynn and estimated an additional 500 would be built in the foreseable future. The projected total number of subsidized units would account for 8% of Lynn's total housing stock, but would still fall far short of the MAPC estimated need of 9,500 subsidized units.

Land Use

Lynn has been highly developed for so long that extensive changes in patterns of land use no longer occur. Although it is primarily an urban area, Lynn does have approximately three square miles of forest preserve known as the Lynn Woods, which is the largest natural municipal forest in the country. About one hundred of acres of wetlands constitute the only undeveloped tracts of land in the city. The largest percentage of developed land is used for residential purposes.

Nearly 1/3 of Nahant's land area is in public or institutional ownership. A very small percentage of Nahant's land is undeveloped. Much of this consists of rocky shores or wetlands or area subject to potential flooding. Future land use will most probably bear close resemblance to the existing pattern because of a lack of open space and the food condition of most structures. Also, the residents of Nahant seem opposed to allowing a greater density of residential development or additional commercial and industrial build-up.

Table 5 provides a summary of land use in the city of Lynn and the town of Nahant.

TABLE 3

LAND USE

CITY OF LYNN AND TOWN OF NAHANT

Use	Lynn		Nahant	
	Percent	Acres	Percent	Acres
Residential	37.00	2,733	51.82	382
Commercial	4.00	296	---	---
Industrial	6.67	493		
Extractive	---	--	---	---
Disposal Sites	.97	72	---	---
Transportative	.97	72	---	---
Public Institutional	4.32	110	8.41	62
Open Space-Recreational	2.97	220	21.84	161
Open Space-Transitional	1.89	140	2.84	21
Agricultural (Cropland)	---	--	---	---
Forest	31.40	2,319	13.43	99
Wetlands (Inland)	.88	65	1.62	12
Wetlands (Saltwater)	.46	34	---	---
Water	7.89	583	---	---

Source: Metropolitan Area Planning Council

Transportation

The major state and interstate highways of the North Shore, State Route 128, U.S. 1 and Interstate 95 all lie outside the Lynn city limits. A series of highway extenstions serves the Lynn-Nahant area. Route 1A, the Lynnway, follows a path adjacent to Lynn Harbor and Lynn Beach, connecting Lynn to Salem and Beverly on the north and Boston, Logan Airport, and Boston Harbor shipping facilities on the south. Route 129 extends from the coast to the western Lynn city limits, cutting across the downtown area and provides access to State Route 128. Route 107 bisects Lynn perpendicular to Route 129 and serves as a major atery for transportation within the city from the southern to the northern boudaries. Nahant is connected to Lynn by the Lynn-Nahant Causeway which provides the only road of access into Nahant.

Commuter rail service in Lynn is currently limited to the Boston and Maine Railroad which connects the city with Boston and eight North Shore communities. No rail service exists in Nahant itself. Piggy-back service is available on the Boston and Maine in Cambridge, Ma. and Penn Central in Boston. Well established truck routes and the short distance to Boston from Lynn combine to offer favorable shipping conditions to all parts of the country and the world.

Central Square in Lynn is the hub of the intra-Lynn and North Shore bus service provided by the MBTA. Bus service in Nahant is relatively infrequent. A proposed extension of the MBTA Blue Line to Central Square and an accompaning 2,000 car parking garage would enhance the Square's status as the focal point of North Shore mass transportation.

Project Setting

The Lynn-Nahant Beach is a continuous beach made up of King's Beach Reservation in the town of Swampscott, Lynn Shore Reservation in Lynn, and Nahant Beach Parkway in Nahant. The beach is 7½ miles north of the main entrace to Boston Harbor and 9 miles northeast of Boston.

The beach comprises a bayhead beach tombolo forming the head of Nahant Bay, and extends a distance of $2\frac{3}{4}$ miles between two headlands, Blaney Rock on the north, and Little Nahant on the south. The section of the beach in Swampscott and the Lynn Shore Reservation in Lynn front a moderately high coastal cliff. The coast is a developed area. Houses near the beach are generally in good condition, while the houses further inland show signs of deterioration. There are also several apartment buildings in the area.

The MDC Reservation consists of a narrow beach, a sea-wall, a promenade, plots of grass, and a wide boulevard. The beach is generally hard-packed sand which extends to the base of the sea-wall. At Red Rock, there is a large ledge outcrop. There is also a large grass area here where people can lounge and children play.

The section of the beach in Nahant is located along the Causeway which connects the former island of Little Nahant to the mainland. The area along the roadway averages about 350 feet in width and separates Lynn Lynn Harbor from the sea. All motorists desiring to enter the beach parking lot must travel south on the causeway and loop back to the lot at the Wilson Road intersection. Near the entrance to the lot are a restaurant, gas station, and refreshment stand. The parking lot has a capacity of around 1,500. There is a 50 cents parking lot fee.

The site of the proposed project is entirely within the Lynn Shore Reservation. It is an area approximately 2,600 feet in length and extends south of Woodbury's Point to the area near the MDC bathhouse. By the bathhouse, for which there is a 10 cents charge, is the MDC police station, a children's play area and refreshment stand. Across the street are a ball field, tennis courts, and boat launching ramp.

At the project site, beach-area currently is minimal. For the majority of the distance from Woodbury's Point to the bathhouse, the water reaches the sea-wall at high tide. Only near the bathhouse does a fairly substantial beach width exist.

One problem at a portion of the project site is a foul-smelling brownish black algae which washes up on the beach frequently. A three year study of the algae problem is underway. Currently, the MDC must periodically scrape the algae off the beach. The algae makes what little beach area that exists in this section virtua-ly useless for recreational purposes.

At present, an estimated 12,000 people use the entire Lynn-Nahant beach on weekdays. and around 30,000 attend on peak summer days. Few people use the Lynn portion of the beach due to a lack of beach space and the algae problem, but the Lynn Shore Reservation does have potential. Under recent conditions people stroll down the promenades which are also used by bicyclists. Concrete picnic tables are available for the beach users. If additional beach is created, erosion and the algae problem reduced, the new beach area would serve to alleviate the crowding that occurs on warm-weather days along the Nahant part of the beach.

III. The Without Project Condition

Without the project, the Lynn-Nahant Beach would continue to be overcrowded on peak summer days. Beach erosion is now so extensive that a minimal amount of beach area exists at the project site. It is felt that the limited amount of beach area available is currently used to its maximum degree on weekends and hot and humid weekdays. Partial evidence of this is the fact that the beach parking lot often fills up before 11:00 am on weekends. As population grows, demands for beach space can be expected to in increase and beachgoers would be forced to seek beach areas elsewhere or forego use of the beach.

Other beaches do exist along the North Shore but suitable alternatives for Lynn-Nahant beachgoers are limited. Many beaches along the North Shore are private. Some limit use to town residents. Parking is a problem at many of the beaches. Most are aleady crowded on warm summer days. Those farthest to the north are too great a distance away for Lynn-Nahant beachgoers to use on a consistent basis.

If a proposed mass transit blue-line extension to Lynn is instituted, Lynn would become more accessible and the result would be an even greater demand for beach space. Also, as gasoline prices rise in the future, people who might normally travel to Cape Cod or other areas would be somewhat more likely to consider Lynn and Nahant. With the desire to use Lynn Beach increasing and the beach area supply remaining relatively constant, it is likely that future demand for beach space would not be satisfied.

IV. The With Project Condition - Impacts

The project will have effects of a social and economic nature. Short term effects will be experienced only while the improvements are being made. These include increased air and noise pollution, increased traffic due to trucks transporting sand to the improvement site, and employment of laborers.

One of the long term results of the project may be an increased traffic flow into the Lynn-Nahant area. The thousands of people who are attracted to the MDC beach on hot summer days have in the past caused some problems for the residents of the area in delays entering and leaving Nahant. A complete reconstruction job was completed on the Causeway in the 1960's. This project placed barriers in the center of the highway in order to reduce the likelihood of head-on crashes and separated the highway from the parking lot with barriers and fencing. However, the necessity of bringing all cars bound for the MDC parking lot to Little Nahant has been troublesome.

Traffic counts taken in the summer of 1975 showed an average daily traffic flow of 14,000 vehicles traveling the Lynn-Nahant Causeway. Peak summer volumes can exceed these rates substantially. If improvements are made to the beach, even larger numbers of motorists can be expected to travel into the area, and traffic congestion would worsen.

At present, the MDC parking lot is usually full by 11:00 AM on weekends. Should the improvements be made, the additional motorists who will be drawn to the area will be forced to a greater extent to find, parking space elsewhere or drop off beach users. This would also increase traffic congestion in the area.

The major long term benefit will be the protection and increase of available beach space developed. The 1973 Comprehensive Open Space and Recreationa Plan of Lynn states that water-based activities are the most popular forms of recreation for residents of the City. The report concludes that water-based recreation should be expanded. The proposed project will help expand salt-water recreation possibilities not only for Lynn residents, but for all those people from the northern part of the Boston metropolitan area who visit the beach.

Effects on tax revenues, property values, and employment are expected to be minimal. If additonal people are drawn to the beach nearby commercial establishements may benefit, but again effects here are expected to be minor. The placement of sand on the beach will heighten the aesthetic appeal of the beach. Overall, by providing a better outlet for recreational activity, the project should be a definite asset to the community.

V. Economics Analysis Methodology

Benefits are developed in compliance with "Subpart K-NED Benefit Evaluation Procedures: Recreation " from " WRC Procedures for Evaluation of NED Benefits and Costs." Recreation use is forecast using a modified capacity approach suitable for an urban area with excess recreational demand such as Lynn. The estimated value of recreational use with the project is determined through the unit day value approximation of willingness to pay. The reasons for using the unit day value method are as follows:

(1) No regional model was available.

(2) Only general recreation is affected.

(3) Annual visits at the improvement site alone are less than 500,000 (Although total annual visits to the entire Lynn-Nahant beach do exceed 500,000.)

(4) The travel cost method is not applicable when the capacity method is used.

(5) The contingent valuation survey is impractical for Lynn.

A sensitivity analysis is undertaken in conjunction with the use of unit day values. Approach 1 places the optimum value of a recreation day at $1.25 based on recent studies of similar beaches. Approach 2 utilizes tables from Appendix 3 to Subpart K to develop appropriate unit day values. Approach 2, which proves to be the more conservative is employed in the final economic justification.

Recreational Benefits

The recreational benefits for Lynn Beach are based on a swimming season extending from late June to early September. Allowing for 25% inclement weather, there are on average 58 days available for beach use. It is estimated 30 of these days can be classified as peak days (weekends, holidays, extremely hot, humid, sunny weekdays.)

According to Corps regulations, a dry beach area of at least 75 square feet per bather at time of peak use has been established as needed to obtain maximum benefit from a beach visit. At Lynn-Nahant Beach under existing conditions, a beach area of 755,000 square feet is available. Although exact attendance records for the Beach are not kept, dicussion with Metropolitan D District Commission (MDC) personnel, local officials, and direct observation indicates that an estimated 30,000 persons per peak day and 12,000 persons per average day visit the beach.

Peak Day Benefits
Approach 1

Lynn Beach is considered to be a fully developed public beach. It has a large parking area and sufficient sanitary and bathhouse facilities. An optimum value of $1.25 per beach visit has been established for fully developed beach areas such as Lynn. This value is based on the assumption that no overcrowding exists.

Assuming a turnover factor of 2, approximately 15,000 people would be on the beach at any given time on a peak day. With 15,000 people competing for 755,000 square feet of beach area, conditions result in the availability of just 50 square feet per bather. Because the average beachgoer at Lynn on a peak day has just two thirds (50ft./75ft.) of the optional amount of beach space, the average value per beach visit is limited to two thirds of the optimum value of $1.25. The average value of a beach visit under existing conditions is therefore estimated to be 83¢ (2/3 x $1.25).

By creating 260,000 additional square feet of beach space, the project would increase total beach area from 755,000 sq.ft. to 1,015,000 sq.ft. This would allow for the use of 68 square feet of beach space per individual. (1,015,000 sq.ft. / 15,000 people.) The value of a beach visit on a peak day would increase from 83¢ to $1.13 for a net increase of 30¢. The total recreational value accrued during the first year of project implementation would be $1,017,000 ($1.13 x 30 days x 30,000 people.)

Without the project, beach attendance on peak days would be limited by the finite amount of beach space available. The present situation of one bather per 50 square feet seems to be a saturation point. It is assumed that beachgoers will not tolerate conditions more crowded than this constraint. It is anticipated, therefore, that beach attendance on peak days would not increase in the future due to limited beach area. The future annual recreational value obtained on peak days without project implementation would be limited to $747,000. (83¢ x 30 days x 30,000 people).

With the project, it is projected that beach attendance on peak days would increase at the same rate as general population growth until the beach area constraint of 50 square feet per bather is once again reached. The population of the most relevant market area of the beach for which projections exist is the Boston SMSA. According to OBERS, the population of the SMSA is expected to increase at a compound rate of approximately .84% a year during the 50 year project lifetime. Assuming that the number of people visiting the beach also grows at .84% per year, attendance would be expected to reach a maximum of 40,600 in the year 2021. This would result in a total recreational value of $1,010,940. ($.83 x 30 days x 40,600 people).

Benefits for the project would range from $270,000 (1,017,000 - 747,000) during the first project year to $263,940 (1,010,940 - $747,000) in the year 2021. The entire stream of benefits resulting from the project is shown by decade in Table 4.

TABLE 4

APPROACH 1

ANNUAL PEAK DAY RECREATIONAL BENEFITS, LYNN BEACH

Year	(Without Project) Current 1980	0 1985	10 1995	20 2005	30 2015	36-50 2021-2035
Value per beach visit	$ .83	$1.13	$1.04	$ .95	$ .88	$ .83
Unit increase in recreational value	---	$ .30	$ .23	$ .14	$ .06	0
Projected annual peak day beach attendance	900,000	900,000	979,000	1,065,000	1,158,000	1,218,000
Annual Recreation Value	747,000	1,017,000	1,018,160	1,011,750	1,019,040	1,010,940
Annual Benefit		270,000	271,160	264,750	272,040	262,940

Equivalent Average Annual Benefits $269,000

(50 Year Project Life, 7 5/8%)

Approach 2

Under Approach 2, the basic assumptions of Approach 1 still hold. However, the optimum value of a recreation day is developed using a point system rather than values used from similar studies. The point system allocates value based on (a) recreation experience, (b) availability of opportunity, (c) carrying capacity, (d) accessibility and (e) environmental quality. After careful examination, points were assigned to Lynn as shown in Table 5. Under existing conditions Lynn obtains 16 out of a possible 100 points. The reasoning behind the distribution of points is as follows:

(a) Recreation experience is limited to general swimming.

(b) Several other beaches exist within one hour travel time.

(c) Carrying capacity is adjusted downward due to overuse on peak days.

(d) Accessibility is good but could be better for walkers and users of public transportation.

(e) Environmental quality is low due to the algae problem.

Points are converted to dollar values using Table 6. Lynn's 16 points under existing conditions convert to a $1.36 unit day recreation value. If improvements are made it is felt that overuse will be reduced to such an extent that the number of points attributable to carrying capacity would increase from 4 to 12. With the project, therefore, total points would be 24 and the unit day recreation value would increase to $1.54.

Project implementation would increase by 18 square feet per individual the amount of beach space available at time of peak use. This gain in square footage coincides with a gain of 8 points. Each one square foot increase per individual therefore results on average in an increase of .44 points. As in Approach 1, growth in attendance with improvements is projected to increase at the .84% compound growth rate of population, subject to the 50 square feet per person capacity constraint. During the project lifetime conditions would be as shown in Table 7.

TABLE 5

TABLE 5

Table K-3 2 - Guidelines for Assigning Points for General Recreation

Criteria	Judgment Factors				
a) Recreation Experience	Two general activities 3/	Several general activities	Several general activities; one high quality value activity 4/	Several general activities; more than one high quality high activity	Numerous hig quality valu activities; some general activities
Total Points: 30					
Point Value: 1	0-4	5-10	11-16	17-23	24-30
b) Availability of Opportunity 7/	Several within 1 hr. travel time; a few within 30 min. travel time	Several within 1 hr. travel time; none within 30 min. travel time	One or two within 1 hr. travel time; none within 45 min. travel time	None within 1 hr. travel time	None within 2 hr. travel time
Total Points: 18					
Point Value: 1	0-3	4-6	7-10	11-14	15-18
c) Carrying Capacity 1/	Minimum facility development for public health and safety	Basic facilities to conduct activity(ies)	Adequate facilities to conduct without deterioration of the resource or activity experience	Optimum facilities to conduct activity at site potential	Ultimate facilities t achieve intent of selected alternative
Total Points: 14					
Point Value: 4	0-2	3-5	6-8	9-11	12-14
d) Accessibility	Limited access by any means to site or within site	Fair access poor quality roads to site; limited access within site	Fair access, fair road to site; fair access, good roads within site	Good access, good roads to site; fair access, good roads within site	Good access, high standar road to site good access within site
Total Points: 18					
Point Value: 9	0-3	4-6	7-10	11-14	15-18
e) Environmental Quality	Low esthetic factors 5/ exist that significantly lower quality 6/	Average esthetic quality; factors exist that lower quality to minor degree	Above average esthetic quality; any limiting factors can be reasonably rectified	High esthetic quality; no factors exist that lower quality	Outstanding esthetic quality; no factors exis that lower quality
Total Points: 20					
Point Value: 1	0-2	3-6	7-10	11-15	16-20

1/ Value should be adjusted for overuse.

2/ Value for water-oriented activities should be adjusted if significant seasonal water level changes occur.

3/ General activities include those that are common to the region and that are usually of normal quality. This includes picnicking, camping, hiking, riding, cycling, and fishing and hunting of normal quality.

4/ High quality value activities include those that are not common to the region and/or Nation and that are usually of high quality.

5/ Major esthetic qualities to be considered include geology and topography, water, and vegetation.

6/ Factors to be considered in lowering quality include air and water pollution, pests, poor climate, and unsightly adjacent areas.

7/ Likelihood of success at fishing and hunting.

8/ Intensity of use for activity.

TABLE 6

TABLE 6

Table K-3 1 - Conversion of Points to Dollar Values

ACTIVITY CATEGORIES	POINT VALUES										
	0	10	20	30	40	50	60	70	80	90	100
General Recreation (Points from Table K-3 2)	1.07	1.25	1.44	1.68	1.93	2.30	2.48	2.67	2.85	3.04	3.22
General Fishing and Hunting (Points from Table K-3 2)	1.57	1.74	1.90	2.07	2.28	2.51	2.73	2.94	3.06	3.17	3.20
Specialized Fishing and Hunting (Points from Table K-3 3)	7.50	7.69	7.88	8.08	8.27	9.03	9.80	10.57	11.34	12.10	12.87
Specialized Recreation Other than Fishing and Hunting (Points from Table K-3 3)	4.29	4.65	5.00	5.36	5.72	6.44	7.15	8.58	10.01	11.44	12.87

NOTE: Unit day recreation values may not exceed the values provided by this table.

TABLE 7

WITH PROJECT CONDITIONS-APPROACH 2

YEAR	SQ.FT./PERSON	POINTS	UNIT DAY VALUE
1985	68	24	$ 1.54
1995	63	22	$ 1.49
2005	58	20	$ 1.44
2015	53	18	$ 1.40
2021-2035	50	16	$ 1.36

The entire stream of benefits accruing to the project is shown by decade in Table 8.

TABLE 6

APPROACH 2

ANNUAL PEAK DAY RECREATIONAL BENEFITS, LYNN BEACH

Year	(Without Project) Current 1980	0 1985	10 1995	20 2005	30 2010	37-50 2021-2035
Value Per Beach Visit	$1.36	$1.54	$1.49	$1.44	$1.40	$1.36
Unit Increase in Recreational Value	--	$ .18	$ .13	$ .08	$ .04	$ .00
Protected Annual Peak Day Attendance	900,000	900,000	979,000	1,065,000	1,158,000	1,218,000
Annual Recreation Value	$1,224,000	$1,386,000	$1,458,170	$1,533,600	$1,621,200	$1,656,480
Annual Benefit	--	$162,000	$234,710	$309,600	$397,200	$432,480

Equivalent Average Annual Benefits $ 255,000

(50 Year Project Life, 7 5/8%)

Average Day Benefits (Applicable for both Approaches 1 and 2)

Allowing for the fact that 30 days of the 58-day season are peak days, the remaining 28 days are considered average days. Discussion with knowledgeable individuals in Lynn resulted in an estimate of a 12,000 attendance figure per average day. Given the current beach space of 755,000 square feet, each bather has the use of approximately 125 square feet. This is well above the 75 square feet required to obtain the maximum benefit from a beach visit. The current beach area is therefore considered adequate to meet present demand on average days.

The present amouht of beach area is also projected to be adequate to meet future demand. If beach attendance increases at the .84% compound annual rate of SMSA population growth, a total of 19,044 people would visit the beach on an average day in the year 2035. With a total area of 755,000 square feet available, each bather would have the use of 79 square feet. This area is still sufficient to obtain the optimum value per beach visit. No benefit would therefore be attributable to the 28 non-peak or average days of the beach season, since beach supply is expected to exceed demand during the 50-year project lifetime. Projected supply and demand for both peak and average days is shown in Figure 1.

Reduction in Maintenance Costs

Information from the Metropolitan District Commission reveals that periodic repair and construction of the seawall, footings, stairs, coping and ramps have been necessary at Lynn Beach. Annual repair bills have ranged from $0 to over $1,000,000. Since the wall was built in 1904, a total of approximately $1.6 million has been spent on wall maintenance. It is estimated that in order to maintain the integrity of the wall another $100,000 is currintly needed.

Project implementation would reduce the money needed for future repairs to the wall. It is estimated that furture expenditures for repairs could be reduced by about half. MDC data indicates that historically on an average annual basis approximately $80,000 (June 1981 price level) is spent to maintain the wall, footings, stairs, etc. Without the project it is likely that this expense will continue at the same level. With the project, cost would be reduced by 50%. The benefit from reduced maintenance for the seawall is therefore .5 ($80,000) or $40,000 annually.

In addition to maintenance costs for the wall, the MDC has found it necessary to allocate funds to clean up amount to around $93,000. It is expected that the placement of sand on the beach would enable the algae to dry faster and make it easier to dispose of and handle. It is anticipated that project implementation would reduce the amount of time needed for algae clean up by 30% and labor costs could be reduced by $7,000 annually.

The total benefit from reduction of maintenance cost amounts to $40,000 + $7,000 = $47,000 annually.

NED FORM 223
27 Sept 49

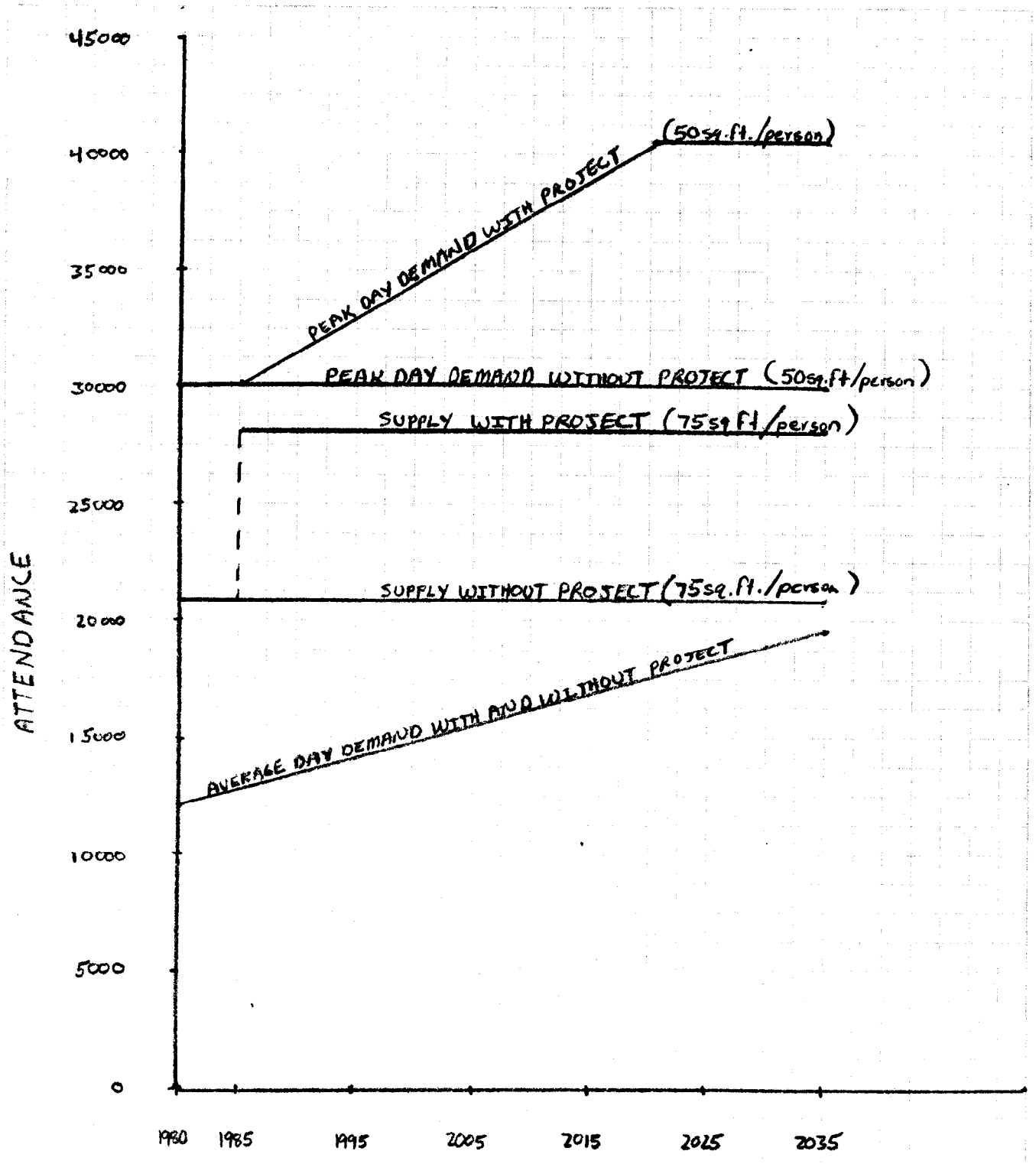
NEW ENGLAND DIVISION
CORPS OF ENGINEERS, U. S. ARMY

PAGE

SUBJECT LYNN BEACH - PROJECTED SUPPLY AND DEMAND

COMPUTATION FIGURE 7

COMPUTED BY CHECKED BY DATE



Economic Justification

Benefits shown below are those derived from the more conservative method, ie. Approach 2.

ANNUAL		
Benefits	Costs	BCR
$302,000	$174,200	1.73

Comparison With Beach Erosion Control Project Adopted 1954

The Lynn Beach Erosion Control Study is an authorized project based on a 1949 U.S. Army Corps of Engineers Study. The 1949 study calculated annual recreational benefits of $20,500 for the project. The annual recreational benefits computed in the current report is $255,000. The chief reasons for the large increase are (1) inflation and (2) increased beach attendance. The 1949 benefit figure was based on a value per beach visit of 10¢, while the current values range from $ .83 to $1.54. The 1949 study reported an average attendance of 10,000 daily and a peak day attendance of 15,000. The current study shows an attendance of 12,000 on an average day and 30,000 per peak day.

APPENDIX 5

PERTINENT CORRESPONDENCE

APPENDIX 5

TABLE OF CONTENTS

The Commonwealth of Massachusetts
Metropolitan District Commission
20 Somerset Street, Boston 02108

JOHN F. SNEDEKER
Commissioner

September 11, 1978

Colonel John P. Chandler
U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02154

Dear Colonel Chandler:

The Metropolitan District Commission requests that the Lynn-Nahant control project, adopted September 3, 1954, be updated to reflect current technology and costs.

The U.S. Army Corps of Engineers' 1949 Report on Beach Erosion Control of Metropolitan District Commission Beaches recommended the artificial placement of 172,000 cubic yards of sand on Lynn Beach for a distance of 2000 feet south of Woodbury's Point.

While over the years considerable sand has been lost due to erosion, this year we found it necessary to dispose of several thousand yards of sand unavoidably removed during our algae cleanup efforts. It is, therefore, particularly appropriate to look to the restoration of Lynn Beach at this time.

There has been considerable activity at this beach this summer, primarily to reduce foul odors released by decomposing algae. We have not only kept the beach free of algae, but have constructed a sand-bag groin to gather data on its effect on erosion. Also, MIT has started its 3-year study under the Sea Grant Program to try to find the cause of the explosive growths of the algae that wash ashore in Nahant Bay.

I would appreciate hearing from you on this matter at your earliest convenience. Fortunately, we now find ourselves in a very good position to carry out a beach improvement program in Nahant Bay.

Very truly yours,

John F. Snedeker,
Commissioner

AFF/JFS:ph

TOWN OF NAHANT, MASSACHUSETTS 01908

OFFICE OF THE

Board of Selectmen

BOARD OF HEALTH – PUBLIC WORKS DEPARTMENT
CEMETERY COMMISSIONERS

RICHARD J. LOMBARD, CHAIRMAN
ROBERT W. STEEVES, SECRETARY
CHARLES A. KELLEY

TELEPHONE (617) 581-0088

- MIKE LENORD -
BOVERINI REP.

28JAN 81-RB

January 27, 1981

Mr. Thomas C. Bruha
Corps of Engineers
424 Trapelo Road
Waltham, Mass.

4FEB.81 -
McGEE OFFICE -
NOON TIME -

RE: MDC Shore Protection Project, Lynn & Nahant
EOEA #03966 (MAPC #ENF-81-22 received
December 4, 1980)

Dear Mr. Bruha:

The Board of Selectmen would like to meet with you, Senator Boverini, and Representative Thomas W. McGee on the proposed sand project mentioned above at your convenience.

Thanking you in advance.

Very truly yours,

BOARD OF SELECTMEN

Richard J. Lombard

Richard J. Lombard
Chairman

RJL/dp

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
NEDPL-C	Lynn-Nahant Beach, MA

TO	FROM	DATE	CMT 1
MEMORANDUM FOR THE RECORD	Project Manager	5 February 1981	

1. On 4 February 1981 Messrs. Martin and Bruha attended a meeting at the Massachusetts State House in the office of Speaker Thomas Magee on the subject beach. The meeting was held at the request of the Nahant Board of Selectmen, Mr. Lombard, Chairman. Others attending the meeting were members of the Speaker Magee's staff, State Senator Boverini for Lynn-Nahant area, two members of the Nahant Conservation Commission, and Mr. Henry Higgott, a MDC representative.

2. The purpose of the meeting was to discuss the proposed Corps-MDC subject beach project. Nahant is concerned that the proposed beach will cause additional problems to the shore located south of the proposed improvement.

3. At the present time, Lynn Beach is experiencing serious erosion of the beach resulting in insufficient dry beach space above the mean high waterline also causing backshore seawall footings to be exposed. In addition there is a serious seaweed problem existing along the backshore causing odors and making it difficult for beach bathers to enjoy Lynn Beach.

4. The seaweed is the main concern of the Nahant Conservation Commission and Selectmen. They would like a guarantee that the proposed beach improvement would not accelerate this serious problem or cause the seaweed to be transported south along their beach. They have consulted with Rev. Brennikmeyer, Geophysicist from Boston University who informed them that reflecting forces off the backshore walls would transfer this seaweed south into their area. This was discussed at length with input from the Conservation Commission, the Senator, and the House Speaker. The Speaker was informed by us that we feel that the proposed plan of sandfill and periodic beach nourishment would prevent any reflection off the backshore walls and would make it more convenient for the MDC to periodically remove the seaweed.

5. The MDC presently has a contract with MIT Seagrant to study this problem. The study began approximately three years ago. So far no concrete conclusions have been arrived at to determine the cause of this seaweed problem or methods of correcting the problem.

6. The Speaker was also informed by us that we were asked by the MDC to determine the economic justification of building the subject beach. Because the beach was authorized in 1954, we have evaluated the project and found that it is economically justified and environmentally acceptable.

7. Throughout the course of the meeting, the Speaker interrupted several times to inform everyone there that this beach area was some years ago a desirable place for family beach bathing. As a decision maker, he felt that the facts presented at this meeting were helpful to him and members of his staff in determining if appropriations to construct the beach by the State are warranted.

8. The Speaker thanked us for attending the meeting and said we would be hearing from him in the near future.

BRUHA

The Commonwealth of Massachusetts
Metropolitan District Commission
20 Somerset Street, Boston 02108
DIVISION OF ENVIRONMENTAL QUALITY

February 17, 1981

Board of Selectmen
Administration Building
Swampscott, Mass.

Gentlemen:

As you may know a meeting was held at the MEPA office in Boston, January 13, 1981, to discuss the environmental issues to be addressed in the Environmental Impact Report on the MDC Lynn-Nahant Beach sanding project. At the time Mr. Kent Murphy of the Swampscott Board of Health and Mr. Robert Perry of the Swampscott Board of Selectmen indicated that an application had been made to the U.S. Corps of Engineers to dredge the boat basin at Fisherman's Beach in Swampscott. They suggested that the material to be dredged could be used to provide sand fill for the above MDC project.

When we asked Mr. Michael Misslin of the Corps' Coastal Development Branch about the Fisherman's Beach project, he stated that it would be 1986 or 1987 before dredging would begin. He said that in three years a phase II Detailed Project Report would be available describing the quality and quantities of sand to be dredged. He also stated that a decision by the Corps on the project's acceptance has not yet been made.

As you know we expect to commence adding sand to the Lynn-Nahant beaches in the spring of 1982. Inasmuch as the Fisherman's Beach project as projected by the Corps is considerably out of phase with our project we cannot become involved with it as a Corps-supported project.

We do not feel justified in obtaining the required information on the material to be dredged from Fisherman's Beach ourselves because of the considerable costs involved and the delays to the Lynn-Nahant project that might result.

If (1) information on quality and quantity of the sand to be dredged from Fisherman's Beach should become available before the spring of 1982, (2) the sand is suitable and (3) its transport to Lynn-Nahant feasible, we will make every effort to use it.

Please do not hesitate to contact me if you require more information on this matter.

Very truly yours,

Alfred F. Ferullo
Director

AFF:jaj

CONSERVATION COMMISSION
NAHANT, MASSACHUSETTS 01908

Feb. 18, 1981

TCB-
9MAR.81.

Honorable Thomas W. McGee
Speaker of the House
State House
Boston, Mass. 02133

Dear Speaker McGee:

Thank you for the time you spent with Nahant's Selectmen and Conservation Commission representatives regarding the Bohlen Plan for the Lynn Beach Sanding Project.

It was stated during the meeting that probably there would be as many theories on the outcome of the Plan as the number of specialists consulted. I have been spending the past two weeks consulting with numerous biologists and ecologists and again with our authority (Fr. B. Brennikmeyer, Ph.D. Geophysics of B. C. who has an international reputation as one of the best in his field). I have not met with ANY positive responses to the Bohlen Plan or any significant difference in theory as the Nahant representatives contributed to the discussion on Feb. 4. The unanimous consensus of that part of the scientific community (which has been varied and extensive) with whom I have consulted has advised AGAINST the implementation of the Bohlen Plan.

Considerable time and expense has been afforded the MIT Sea Grant Project at Lynn. Destroying the ecological balance of the Lynn-Nahant Beach area may well render their efforts, observations, testings, conclusions and any pending recommendations useless and may well render the environment affected negatively forever.

Only adequate, thorough testing and research can protect our recreational seashores from devastation caused by our own impatience. As they say, "You can fool some of the people some of the time," "But you can't fool Mother Nature."

Very truly yours,

Martena C. Fallon

Martena C. Fallon
Nahant Conservation Commission

cc: Selectmen, Nahant
cc: Army Corps of Engineers
cc: MDC
cc: A. Quinn, MIT Sea Grant

5-7

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
New England Area Office
P. O. Box 1518
Concord, New Hampshire 03301

Colonel William E. Hodgson
Deputy Division Engineer
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

APR 1 1981

Dear Colonel Hodgson:

We are sending you endangered species information to assist you in planning for the beach improvement measures at Lynn Beach, Lynn, Massachusetts.

Our review shows that except for occasional transient individuals, no Federally listed or proposed species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further consultation is required with us under Section 7 of the Endangered Species Act. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to endangered species under our jurisdiction. It does not address other legislation or our concerns under the Fish and Wildlife Coordination Act.

Sincerely yours,

Gordon E. Beckett

Gordon E. Beckett
Acting Area Manager

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
P.O. Box 1518
Concord, New Hampshire 03301

Colonel William E. Hodgson
Deputy Division Engineer
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

APR 3 1981

Dear Colonel Hodgson:

This letter is intended to aid you in your study of possible solutions to algae problems at Lynn Beach, Lynn, Essex County, Massachusetts. It has been prepared in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

Lynn Beach is a heavily used public beach located between Nahant and Kings Beach. It can be characterized as a pocket beach along with the other beaches, being separated from Kings Beach only by Red Rock. This ledge is used by fishermen seeking cod, mackerel, flounder and other species. The high water line at Lynn Beach lies against the seawall and above the 700-foot wide beach. Adding 200,000 cubic yards of sand is intended to raise the surface high enough to promote drying of a nuisance algae that collects on the sand. The sand now remains wet and this promotes decomposition and odor problems and hinders collection of the seaweed.

We understand that the sand fill will be the most likely alternative. Other alternatives included a stone mound along the backshore at Nahant and stonework protection of the concrete seawall just south of Red Rock.

The beach area has populations of surf clams and razor clams. Ocean quahoags are located beyond the low tide line and probably would not be impacted by the project unless sand migrates from the beach. A spring gill-net fishery in the bay should not be adversely affected by the project.

The proposed project is not expected to cause serious adverse impacts to fish and wildlife resources. The most potential for adverse impact is migration of a large amount of sand from the beach. If this sand covers offshore shellfish beds it would cause a temporary adverse impact. We recommend that your report include information on the expected rate of erosion and location of offshore deposition, if it can be determined.

5-9

While the sand fill is expected to have little effect on the resources, we are concerned that filling does not address the cause of the algae

Maintenance dredging of nearby Lynn Harbor channels will be done in the future by the Corps or by the Commonwealth. Deepening of these channels is being considered. It is possible that at least some of the spoil from these projects would be suitable for fill at Lynn Beach. We feel that the projects should be coordinated so that offshore disposal of spoil can be minimized and the material can be used to best advantage.

Please send me a draft of your report so that we can prepare a final report and on the selected plan.

Sincerely yours,

Gordon E. Beckett

Gordon E. Beckett
Supervisor

NEDPL-I

27 May 1981

Ms. Bourassa/lm/345

Ms. Patricia L. Weslowski, Executive Director
State Historic Preservation Office
Massachusetts Historic Commission
294 Washington Street
Boston, Massachusetts 02108

Dear Ms. Weslowski:

We would appreciate your comments concerning possible effects on cultural resources of a Beach Erosion Control Project in Lynn, Massachusetts. Inclosed is a brief description of the area and project alternatives.

As you will note in the photographs, a seawall was erected along this section of the beach. The sands in front of the seawall have been churned and washed away by wave action.

Our Cultural Resources staff believes that the alternatives, as outlined, would have minimal effect on archaeological resources in view of this history of wave action.

If you have any questions in this matter, please call John Wilson or Marie Bourassa at 894-2400, extension 345. Thank you very much.

Sincerely,

JOSEPH L. IGNAZIO
Chief, Planning Division

Incl
As Stated

cc: Mr. Bruha
Mr. Dupee
Ms. Bourassa
Planning Div. File

MASSACHUSETTS HISTORICAL COMMISSION

COMMONWEALTH OF MASSACHUSETTS
Office of the Secretary of State
294 Washington Street
Boston, Massachusetts
02108
617-727-8470

MICHAEL JOSEPH CONNOLLY
Secretary of State

June 5,]98]

Joseph L. Ignazio
New England Division
Army Corps of Engineers
424 Trapelo Road
Waltham, MA 02254

RE: Beach Erosion Control Project, Lynn Beach

Dear Mr. Ignazio:

Thank you for supplying the Massachusetts Historical Commission with information with your letter of May 27, 1981.

MHC staff have reviewed the proposed Beach Erosion Control Project for Lynn Beach. MHC feels that this project is unlikely to affect significant historic or archaeological resources. No further review in compliance with Section 106 of the National Historic Preservation Act of 1966 is required.

If you have any further questions, please contact Eric Johnson of my staff.

Sincerely,

Patricia L. Weslowski
Executive Director
Massachusetts Historical Commission
State Historic Preservation Officer

PLW/EJ/pb

MEMORANDUM FOR THE RECORD

BY: Alfred F. Ferullo, Director of Environmental Quality AFF

SUBJECT: Meeting at Nahant Town Hall on June 23, 1981 Relative to the Lynn-Nahant Shore Protection Project.

DATE: June 30, 1981

The subject meeting was held at the request of the MDC to provide an opportunity to the members of the Lynn, Nahant and Swampscott Conservation Commissions to make known their concerns about the project in an informal setting. The draft environmental impact report (EIR) being prepared by Dr. W. Frank Bohlen is scheduled to be submitted to the MDC on July 15, 1981. Dr. Bohlen wanted to ensure that we were not ignoring some important aspects of the project that may have been overlooked. The meeting provided a forum for discussing the purpose of the project, its anticipated benefits, the impacts during construction and the algae problem.

The meeting was held at Nahant Town Hall at 7:30 p.m. and was attended by the following:

Lynn Conservation Commission
- Peter DeVeau
- Chris C. Mpelkas
- Paul A. Petrouski
- Eugene J. Dooley

Nahant Conservation Commission
- Pat McArdle
- Paul Sciaba
- Gene Canty
- Carolyn Dineen
- Tina Fallon

Swampscott Conservation Commission
- Esther Irving
- Sarah P. Ingalls

Rep. Bassett's Office
- Michael Sullivan

Carl and Norma Brooks

Nahant Planning Board
- Polly Bradley

Boston College
- Benno Brenninkmeyer

Mystic Com.
- Dr. W. Frank Bohlen

Metropolitan District Commission
- Alfred F. Ferullo

There were many questions from the members of the these Conservation Commissions. Benno Brenninkmeyer, Assistant Professor of Marine Geology at Boston College discussed with Dr. Bohlen the methods used in the latter's Wave Refraction Study performed for the M.D.C. in 1980. There were questions about traffic problems beyond the immediate vicinity of the project site. The need for protection of the sea wall was questioned.

The overwhelming worry of the people from Nahant was that the project would result in the displacement of the algae from Lynn Beach to Nahant Beach. Much of the discussion centered around this issue, Pat McArdle, chairperson of the Nahant Conservation elicited from Dr. Bohlen that there was about a ten percent probability that algae would be displaced to Nahant Beach, We (Dr. Bohlen and I) said that it was impossible to guarantee that the algae problem would not move to Nahant and that if it did the M.D.C. would remove it as we are doing at Lynn Beach.

Inasmuch as the meeting was intended to give the Conservation Commission members maximum opportunity to ask questions and also since the EIR is not ready to "go public" the meeting was closed to the public.

ANTHONY D. CORTESE, Sc. D.
Commissioner

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Quality Engineering
Division of Water Pollution Control
One Winter Street, Boston 02108

August 25, 1981

Samual Mygatt, Executive Director
Environmental Impact Review
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

Re: DEIR Comments
EOEA No. 02966
MDC
Lynn

Attention: MEPA Unit

Dear Mr. Mygatt:

We have had an opportunity to review the Draft Environmental Impact Report for the shore protection project proposed by the Metropolitan District Commission at Lynn-Nahant beach. The proposal calls for 200,000 cubic yards of clean sand to be placed along a 2600 foot section of the shoreline. Anticipated benefits of this project include increased recreational utilization of the beach, increased stability of the seawall, reduction of shorefront flooding, and alleviation of the brown algae (Pilayella littoralis) decomposition problem. The following are our comments on the DEIR.

A discussion on ocean sources of sand and dredged material sources should be included in the Final Environmental Impact Report. A number of dredging projects have been proposed in the vicinity of Lynn-Nahant beach that may yield suitable beach nourishment material. It may be feasible to coordinate activities with the Corps of Engineers since they are co-sponsors with the present study. A number of navigational projects including one each in Lynn Harbor, the Pines River, Revere, Swampscott Harbor, as well as maintenance dredging in Newburyport have been proposed that are near the present study. These and other near shore sources of sand should be given equal consideration with land sites and reasons for their selection and deletion should be included in the FEIR.

There are benefits to near shore sites which may make them an attractive alternative. Hydraulic dredging of sand will eliminate truck traffic, and will decrease the amount of time needed for construction of the project.

Assuming the use of a small class 12 inch hydraulic dredge, which can pump 2400 cubic yards of sand per day, less than 100 days would be needed to complete the project. This will eliminate the need for split work seasons (as needed with a land source), and will allow construction in the off-season, preferably between September to November.

As requested by this Division in our January 12, 1981 memo to your office, we recommend that the sand embankment placed on the Saugus marshes also be considered as a source of material in the DEIR. Reasons for its rejection or acceptance as a source should be outlined.

The Division foresees minimal water quality impacts at the site, provided that the fill is a Category One, Type A material as classified by the regulations entitled "Dredging, Dredged Material Disposal, and Filling in Waters of the Commonwealth", 314 CMR 9.00.

Should you have any questions, please contact Richard Tomczyk of my staff at 426-5044.

Very truly yours,

Thomas C. McMahon
Director

TCM/RT/wp

cc: Alfred F. Ferullo, MDC, 20 Somerset Street, Boston 02108
Environmental Protection Agency, Environmental & Economic Impact Office, John F. Kennedy Building, Boston 02203
U.S. Army Corps of Engineers, 424 Trapelo Road, Waltham 02154

Mygatt DS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J. F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

RECEIVED
SEP 8 1981
OFFICE OF THE SECRETARY
OF ENVIRONMENTAL AFFAIRS

September 2, 1981

Secretary John A. Bewick
Executive Office of Environmental Affairs
Leverett Saltonstall Building
100 Cambridge Street
Boston, MA 02202

ATTN: MEPA UNIT
RE: Lynn-Nahant Shore Protection EOEA No. 02966

Dear Secretary Bewick:

We have reviewed the Draft Environmental Impact Report (dated August 1981) for the above referenced proposed project. We have also reviewed the Section 404(b) Factual Determination and Finding of Compliance prepared by the New England Division, Corps of Engineers, dated 24 July 1981.

We have no objection to the proposed placement of sandfill on Lynn-Nahant Beach.

Sincerely yours,

for Allen J. Ikalainen
Chief, Special Permits Section

cc: Alfred F. Ferullo, MDC, Boston, MA
Joseph L. Ignazio, COE, Waltham, MA
USFWS, Concord, NH
NMFS, Gloucester, MA

COASTAL ZONE
MANAGEMENT

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

October 30, 1981

Alfred F. Ferullo
Metropolitan District Commission
Parks and Recreation Division
20 Somerset Street
Boston, MA 02108

Dear Mr. Ferullo:

We initiated our review of the consistency certification contained in the DEIR on August 7, 1981 and will proceed according to the attached schedule. Since the FEIR is not yet available, we will be extending the review period beyond the 3 month deadline of November 3, 1981. In order to reach a well reasoned conclusion to our review at the end of the 6 month period, the Secretary of EOEA's final decision on the MEPA process must be available to us.

Please contact me with any questions that you may have.

Sincerely,

Michael E. Penney

Michael E. Penney
Project Review Coordinator

MEP:bam
cc: Joseph L. Ignazio, Planning Division, COE
Tom Bruha, COE
Frank Bohlen

Consistency Review Schedule
for an Activity Requiring both
Federal and State Licenses or Permits*

Review Step	Date
1. (a) Received Consistency Certification on	Aug. 7, 1981
(b) Received copy of Secretary's final decision concerning MEPA process on	not yet available
2. Submitted for publication in earliest possible Environmental Monitor on (either the 31st of 15th of month)	Aug. 31, 1981
3. Notice inviting comments and opening 21 day comment period will appear in Monitor on (either the 8th or the 22nd of month)	Sept. 8, 1981
4. Comment period closes	Sept. 29, 1981
5. Publication of notice of hearings must appear in the Environmental Monitor and follow steps 2, 3 and 4. Hearing date	none expected
6. We must notify applicant and agency of review status within 3 months of Step 1. Last date for notification	Nov. 3, 1981
7. We must issue our decision within 6 months of Step 1. Review period closes	Feb. 3, 1981

Lynn/Nahant Beach - MDC Beach Nourishment

* Sections 7.23(b), 7.25(c,d), 7.26, 7.27, 7.28, 7.29 CZM Regulations

COASTAL ZONE
MANAGEMENT

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

November 2, 1981

Tom Bruha
U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Mr. Bruha:

As per your request this letter shall confirm that our Office is proceeding with the Federal Consistency Review of the consistency certification submitted in the DEIR by the MDC for the Lynn/Nahant beach nourishment project. Although many concerns have been raised over the DEIR submitted to the Secretary of Environmental Affairs under the MEPA requirements, at this time we do not forsee any unresolvable issues that would result in the project being declared not consistent with the MCZMP.

Our final decision can be made by our office only after the FEIR is completed and the Secretary finds the report adequate.

Should you have any questions please contace Mr. Jeff Benoit of my staff at 727-9530.

Sincerely,

Richard F. Delaney

Richard F. Delaney
Director

RFD:JB:bam

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Services Division
Habitat Protection Branch
Gloucester, MA. 01930

November 24, 1981

Mr. Joseph L. Ignazio
Chief, Planning Division
Department of the Army
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, MA. 02254

Dear Mr. Ignazio:

This is a follow-up letter to a site visit and discussions with your office, the U.S. Fish and Wildlife Service, Massachusetts Division of Marine Fisheries, and local authorities relative to the Lynn-Nahant Shore Protection Project and its Draft Environmental Impact Report dated August, 1981.

Project plans call for placing approximately 185,000 to 200,000 cubic yards of clean sand fill along a 2,600-foot segment of the shoreline at Lynn-Nahant Beach in an area northward of the Metropolitan District Commission beach-house to Woodbury's Point. The purposes of the project are to increase the recreational utility of Lynn Beach, increase the stability of the adjoining seawall, reduce shorefront flooding, and attempt to alleviate odors associated with the decomposition of algae stranded along the beach front.

The report adequately describes the anticipated impacts of the sand fill on the beach. Project implementation is expected to cause adverse impacts to the biological community that exists within the intertidal zone. These impacts will result from burial of the benthic organisms by the placement of sand. This intertidal community, however, would eventually recolonize. Because of this, we do not anticipate long-term adverse impacts, and therefore we have no objection to project implementation.

Sincerely,

Ruth Rehfus

Ruth Rehfus
Branch Chief

The Commonwealth of Massachusetts
Metropolitan District Commission
Engineering Division
20 Somerset Street, Boston 02108

December 11, 1981

Colonel C.E. Edgar
Division Engineer
Department of the Army
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, MA 02154

Subject: Lynn-Nahant Beach
Erosion Control Improvement NEDPL-C

Dear Colonel Edgar:

We have reviewed Volume I of the draft letter report relative to the above referenced project prepared by your office.

Attached herewith are our comments.

Very truly yours,

Francis H. McCarran, Jr.

FRANCIS H. McCARRAN, JR.
Director of Parks

JC/ps
Attach/as noted above
cc: Commissioner Terrence Geoghegan

p.6. Last paragraph. Take out "a series of open public"

p.7. Last paragraph. Add "and related expenses"

p.1-5 Under Environmental Concerns change "environmental assessment" to "Environmental Impact Report."

p.1-11 Second paragraph. Change "Environmental Impact Report" to "Draft Environmental Impact Report."

p.2-1 & 2-2 Should be changed. Attached is suggested revised copy

p.4-1 First paragraph. Most recent estimate of sand quantity is 175,000 cubic yards.

p.4-8 Fourth paragraph. The MDC does not truck algae away but returns it and the sand back to the water.

p.4-8 Last paragraph. The algae problem will not be "solved" but "reduced." Same comment for last paragraph on p.4-10

p.4-12 Third paragraph. Please recalculate additional square feet of beach space based on adding 175,000 cu. yds., of sand to Lynn-Nahant Beaches.

Please remove pages 5-10 and 5-12.

1. Local sponsor (Commonwealth of Massachusetts) should agree that it will:

a. Prior to commencement of work, obtain approval from the Office of the Chief of Engineers in Washington, DC of the detailed plans and specifications and the arrangements for prosecuting the work on the project.

b. Construct the project at local expense presently estimated at $1,510,000. The Federal share of the cost of construction is 57.7 percent completion of construction.

c. Provide, without cost to the United States, all lands, easements, and rights-of-way necessary for project construction and subsequent maintenance of the project.

d. Maintain continued public ownership of the shore upon which the Federal participation is based and its administration for public use during the 50-year economic life of the project.

e. Hold and save the United States free from all claims for damages that may arise before, during, or after prosecution of the work and subsequent maintenance of the project other than damages due to the fault or negligence of the United States or its contractors.

f. Maintain the protective measures as necessary during the 50-year economic life of the project as may be required to serve their intended purpose by contributing 42.3 percent of the cost of periodic annual sand nourishment for the economic life of the project. The Federal share is 57.7 percent and will be reimbursed to non-Federal interests upon the completion of each nourishment operation.

g. The non-Federal interests shall maintain books, records, documents, and other evidence pertaining to costs and expenses incurred in the performance of the work to the extent and in such detail as will properly reflect all net costs of whatever nature involved therein. The non-Federal interests shall make available at their offices at reasonable times the accounting records for inspection and audit by an authorized representative of the Division Engineer.

h. The Government shall reimburse the non-Federal interests for its participation upon receipt of properly certified invoices, in quadruplicate, supported by such evidence of payment as may be required by the contracting officer.

i. Report water quality violations to the Division of Water Pollution Control to safeguard the health of the bathers.

j. Comply with the requirements of non-Federal cooperation specified in Section 210 and 305 of Public Law 91-646 approved 2 January 1971 entitled "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970."

k. Comply with Title VI of the Civil Rights Act of 1964 (78 Stat 241) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations.